



# **COAL RESOURCES OF CLARION COUNTY, PENNSYLVANIA**

## **PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS**

Compiled by  
Albert D. Glover

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL RESOURCES  
OFFICE OF RESOURCES MANAGEMENT  
BUREAU OF  
TOPOGRAPHIC AND GEOLOGIC SURVEY  
Donald M. Hoskins, State Geologist



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**Compiled by Albert D. Glover**  
Pennsylvania Geological Survey

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PENNSYLVANIA GEOLOGICAL SURVEY  
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**1987**

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over, Albert D.  
al resources of Clarion  
ounty, Pennsylvania

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# **COAL RESOURCES OF CLARION COUNTY, PENNSYLVANIA**

## **PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS**

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### **INTRODUCTION**

An important function of the Bureau of Topographic and Geologic Survey is to provide accurate, timely information on Pennsylvania's bituminous coal. To achieve this goal, the Bureau is working in cooperation with the U.S. Geological Survey to establish the National Coal Resources Data System (NCRDS). NCRDS is a computer data system developed by the U.S. Geological Survey to facilitate coal-resource calculations for the nation on a county-by-county and seam-by-seam basis, and to produce various kinds of tables and maps of coal characteristics.

Before NCRDS can be used for a particular bituminous-coal-producing county, all available data on the coal must be entered into the computer system. These data include site-specific (point-location) stratigraphic measurements and coal analyses, and specific map elements compiled on 7½-minute topographic quadrangle maps. The map elements, which include coal outcrop lines, structure contours, and mined-out areas, are digitized and stored in the system for subsequent computer manipulations.

The maps in this report represent part of phase one of NCRDS for Pennsylvania. Phase two will include the various computer-generated tables and maps of coal characteristics for the state. As the data base for each county is completed and the derivative tables and maps of coal quality are produced, their availability will be publicly announced.

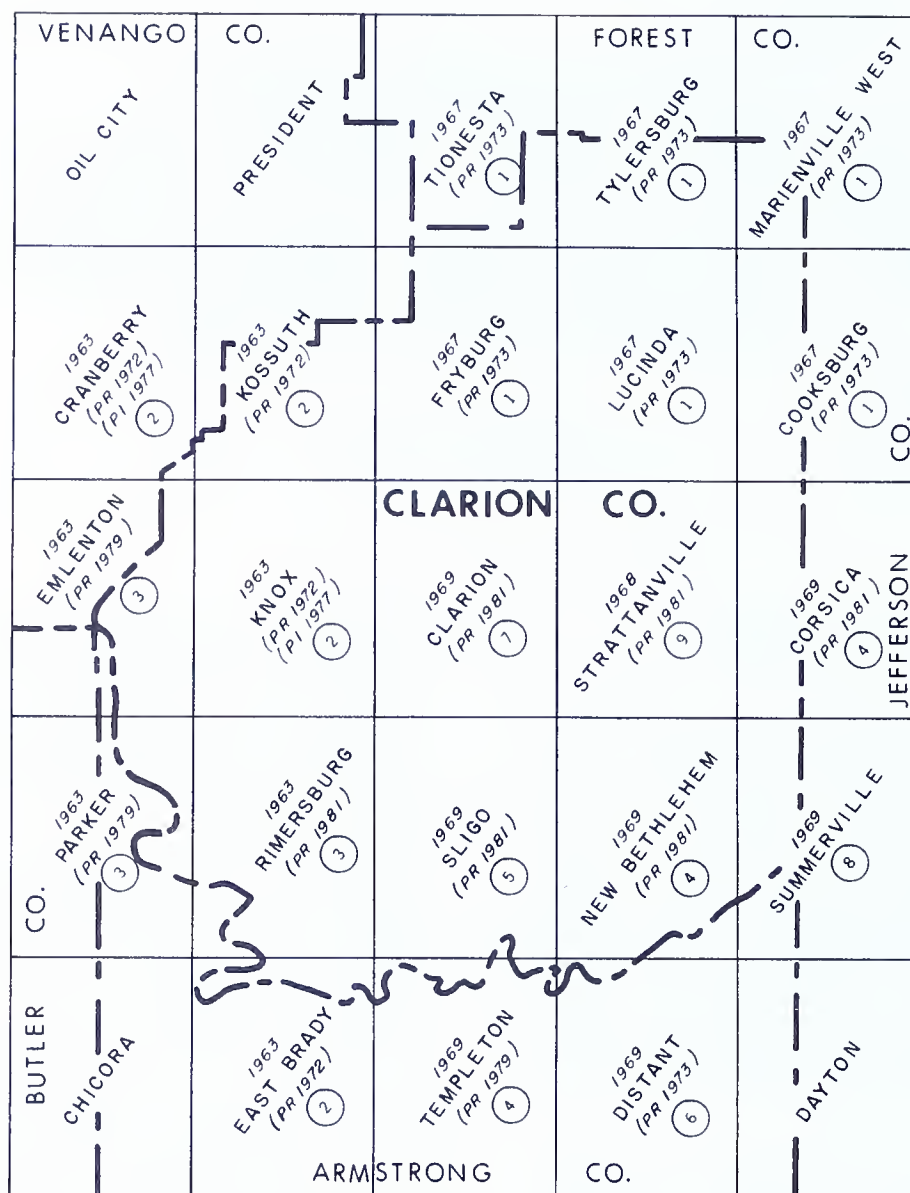
Inasmuch as the maps showing coal outcrop lines and mined-out areas are in constant demand by the

coal industry, consultants, planners, government personnel, and academicians, they are being made available in this publication. These maps will be of considerable help in planning exploration programs, land acquisition, land use planning, and environmental protection.

Two kinds of coal maps may be included for each 7½-minute quadrangle covering Clarion County (Figure 1). First, for each of the principal coal seams in a given quadrangle, there is a map showing (1) the coal outcrop (crop line), and (2) the extent of all known strip and deep mining up to the time of compilation (1985). Second, for each quadrangle, there is a composite map showing the crop lines of all of the principal coal seams (Figure 2), structure contours, and fold axes. If none of the principal coals have been mined or crop out in a particular quadrangle, only the second kind of map is presented. All of the maps contain information on sources of data, map reliability, and map symbols. In addition, the composite maps contain information on structure-contour intervals and datums, and names of fold axes. The general layout of the compilation maps is shown in Figure 3.

The Lower Clarion coal in Clarion County is believed to be equivalent to the Brookville coal in adjoining counties and is the lowermost coal in the Allegheny Group (see Figure 2). For purposes of simplification, the Lower Clarion (Brookville) coal crop line is labelled Lower Clarion (lcl) on the accompanying maps in this report.

The assessment of the reliability of a geologic map can be rather subjective. However, there has been a considerable amount of strip mining in



Based on aerial photography taken:

- |                         |                         |
|-------------------------|-------------------------|
| ① 1967, 1968, and 1973. | ⑥ 1966, 1967, and 1973. |
| ② 1962 and 1972.        | ⑦ 1966, 1969, and 1977. |
| ③ 1962 and 1977.        | ⑧ 1967.                 |
| ④ 1967 and 1977.        | ⑨ 1967, 1969, and 1977. |
| ⑤ 1966 and 1977.        |                         |

Figure 1. Index map of 7 1/2-minute quadrangles in Clarion County. Dates of publication of topographic quadrangle maps are shown in italic type. Dates of photorevision (PR) and photoinspection (PI) are shown in parentheses.

Clarion County. For this reason, the reliability of crop lines and structure contours on these maps is believed to be very good, having an accuracy within 20 feet ( $\pm 10$  feet) vertically.

The reader is advised that all of the original compilation maps are available for public inspection at the offices of the Pennsylvania Geological Survey

in Harrisburg. The scale of the original maps is 1:24,000.

The following list of references can be used to locate further information on the geology of Clarion County and the quality of coal in the county.

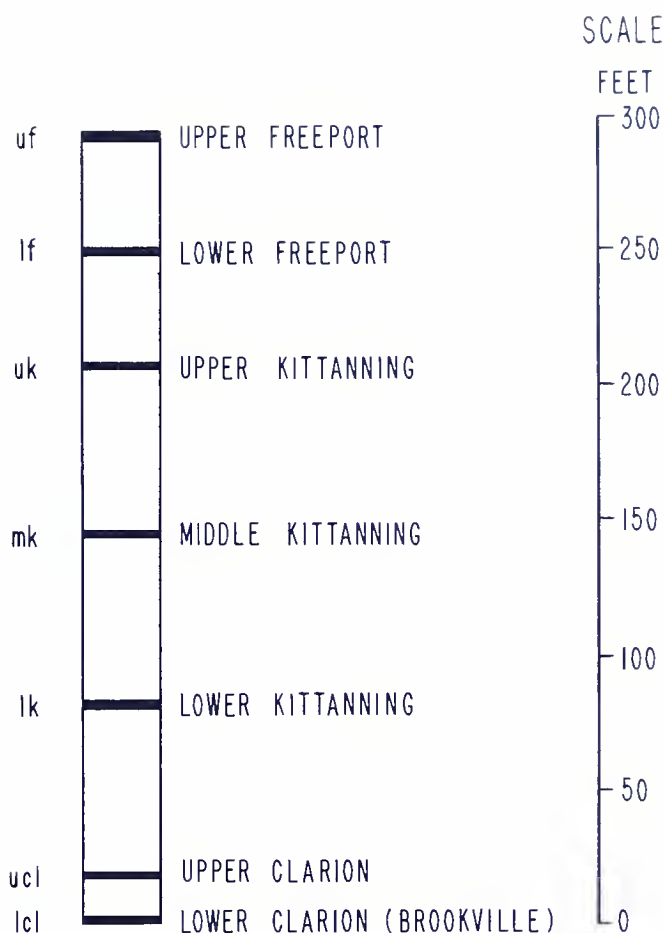


Figure 2. Stratigraphic position of the principal coal seams in Clarion County. Thicknesses of the coal seams are exaggerated.

## REFERENCES

- Birge, G. W., Wolfson, D. E., and Lynch, J. H., Jr. (1963), *Carbonizing properties of coals from Elk, Clarion, Jefferson, Clearfield, and Centre Counties, Pa.*, U.S. Bureau of Mines Report of Investigations 6261, 22 p.
- Blaylock, D. W., Dowd, J. J., Abernethy, R. F., and Reynolds, D. A. (1956), *Estimate of known recoverable reserves of coking coal in Clarion County, Pa.*, U.S. Bureau of Mines Report of Investigations 5231, 27 p.
- Butts, Charles, and Leverett, Frank (1904), *Kittanning folio*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 115, 15 p.
- \_\_\_\_\_. (1905), *Rural Valley folio*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 125, 11 p.
- \_\_\_\_\_. (1906), *Economic geology of the Kittanning and Rural Valley quadrangles, Pennsylvania*, U.S. Geological Survey Bulletin 279, 198 p.
- Graeber, C. K., and Foose, R. M. (1942), *Brookville quadrangle—Geology and mineral resources*, Pennsylvania Geological Survey, 4th ser., Atlas 54, 136 p.
- Lines, E. F. (1907), *Coals of the Clarion quadrangle, Clarion County, Pa.*, in Campbell, M. R., geologist in charge, *Contributions to economic geology, 1906—Part II,—Coal, lignite, and peat*, U.S. Geological Survey Bulletin 316-A, p. 13-19.
- Patterson, E. D., and Van Lieu, J. A. (1972), *Geologic and coal-bed map of Clarion County, Pennsylvania*, U.S. Geological Survey Miscellaneous Geologic Investigations Map 1-715, scale 1:62,500.
- Shaw, E. W., Lines, E. F., and Munn, M. J. (1911), *Foxburg-Clarion folio, Pennsylvania*, U.S. Geological Survey Geologic Atlas of the U.S., Folio 178, 18 p.
- Zeilinger, J. E., and Deurbrouck, A. W. (1968), *Preparation characteristics of coal from Clarion County, Pa.*, U.S. Bureau of Mines Report of Investigations 7174, 34 p.

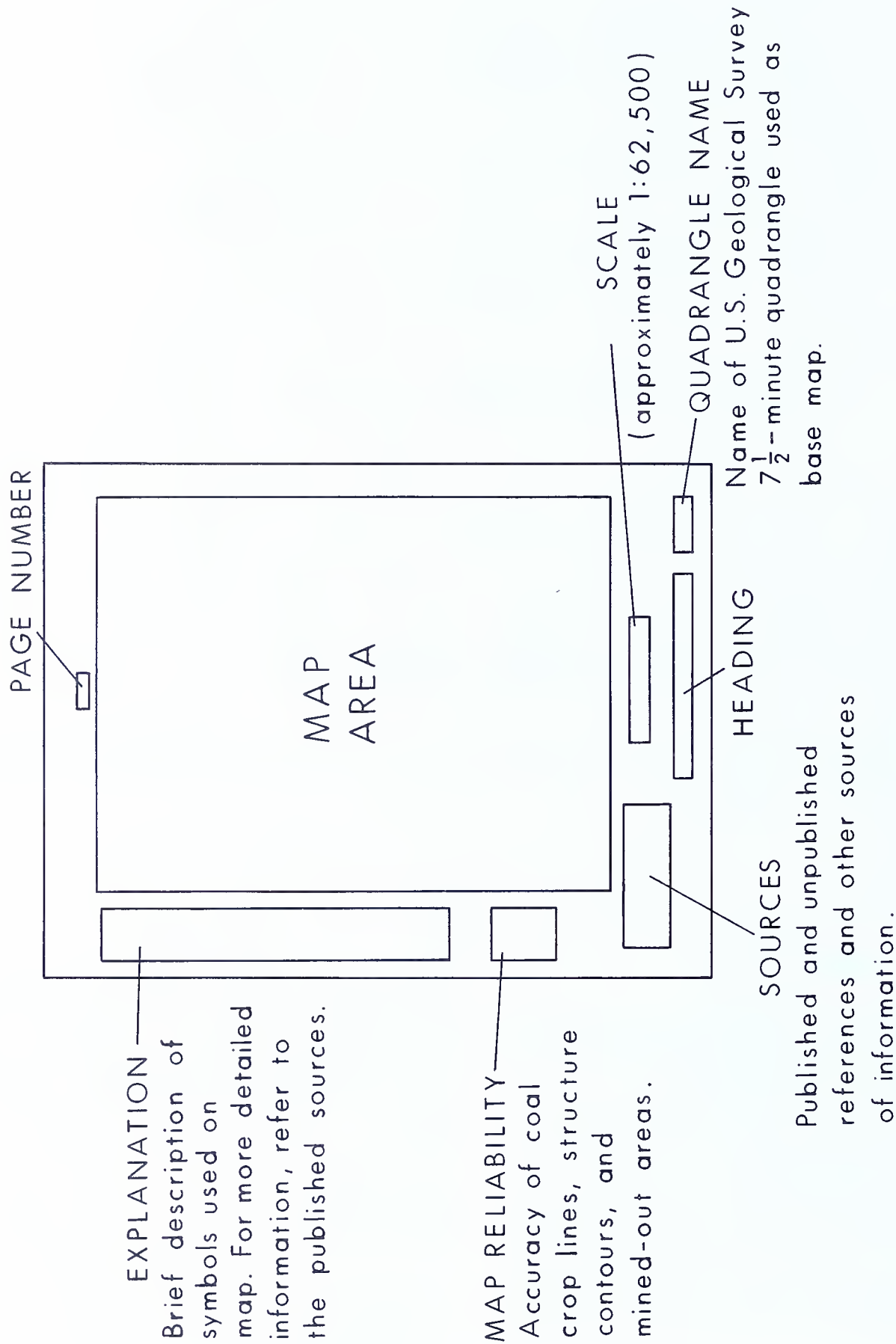


Figure 3. Guide to layout of compilation maps.



# EXPLANATION

Crop line of the  
Lower Clarion coal

Extent of known  
strip mining

Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate

## SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map  
and unpublished data.  
Limits of deep mining from unpublished mine maps.

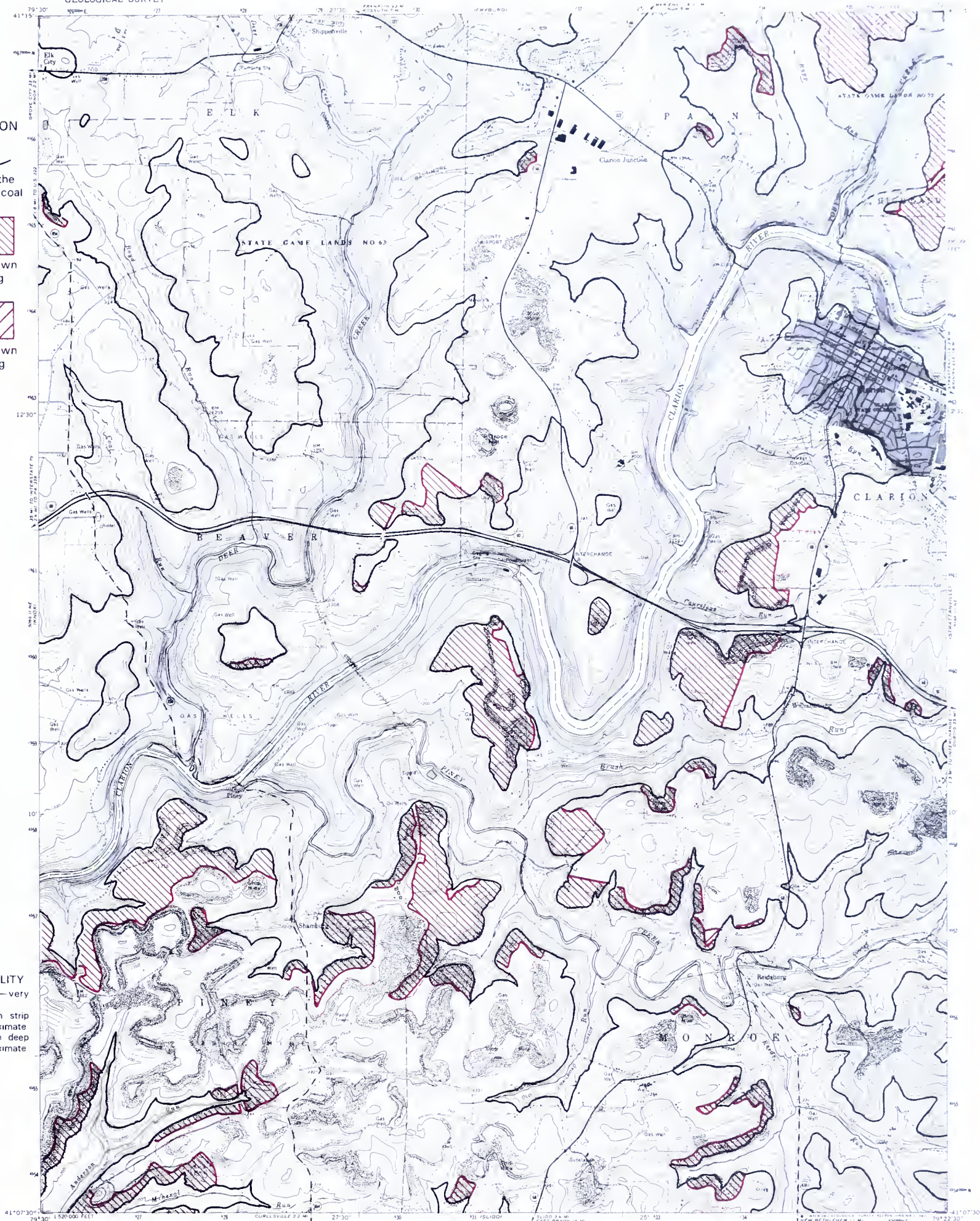
UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Primary highway  
hard surface  
Secondary highway  
hard surface  
Light-duty road, hard or  
improved surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

CLARION

## CROP LINE AND MINED-OUT AREAS OF THE LOWER CLARION COAL







# EXPLANATION

Crop line of the  
Upper Clarion coal



Extent of known  
strip mining

## MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

## SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map  
and unpublished data

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE ~1:62500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Primary highway, hard surface  
Secondary highway, hard surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

PENNSYLVANIA  
QUADRANGLE LOCATION

## CROP LINE AND MINED-OUT AREAS OF THE UPPER CLARION COAL

CLARION





EXPLANATION

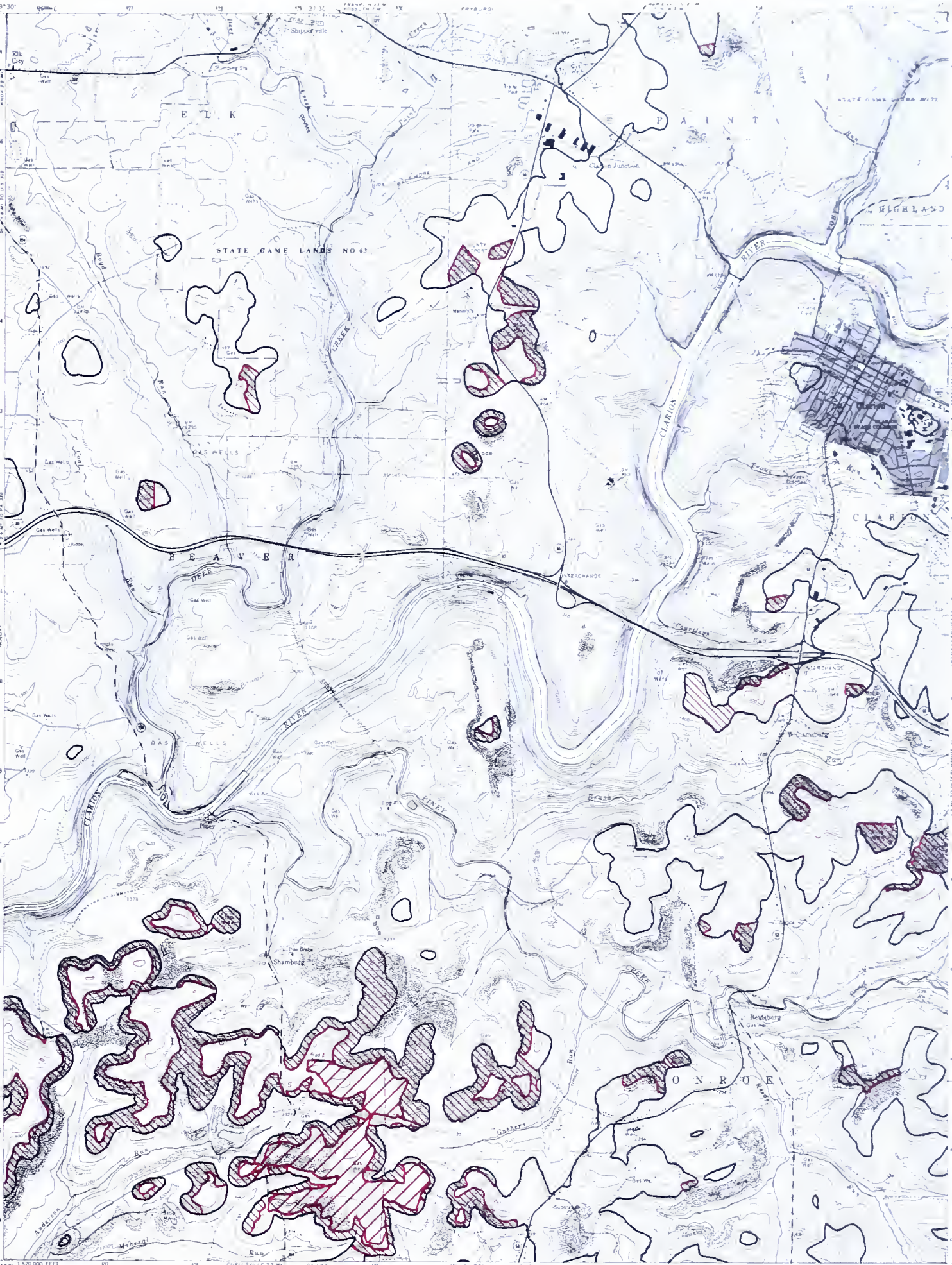
Crop line of the  
Lower Kittanning  
coal

Extent of known  
strip mining

Extent of known  
deep mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

CLARION





EXPLANATION

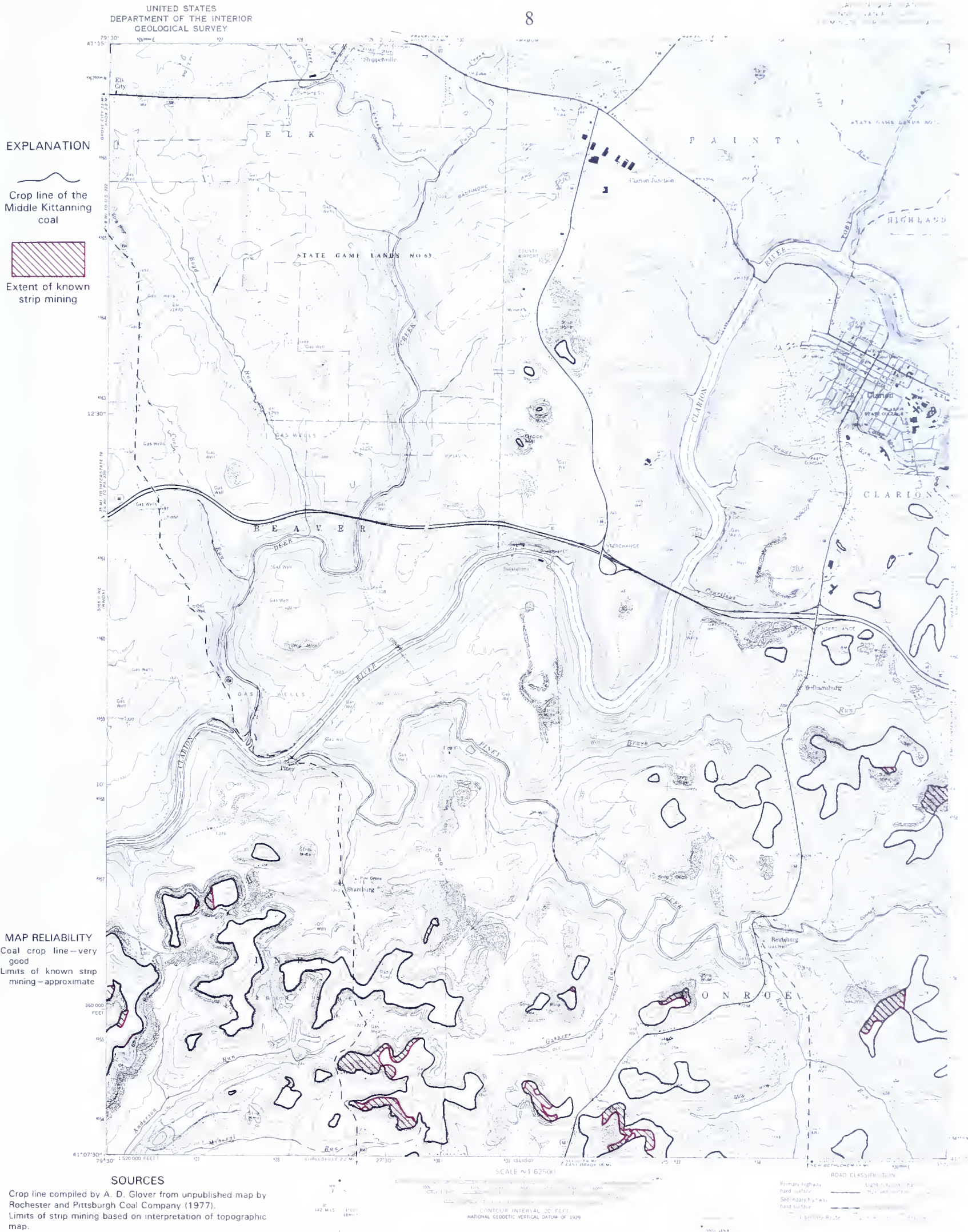
Crop line of the  
Middle Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL

CLARION





EXPLANATION

Crop line of the  
Upper Kittanning coal

Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

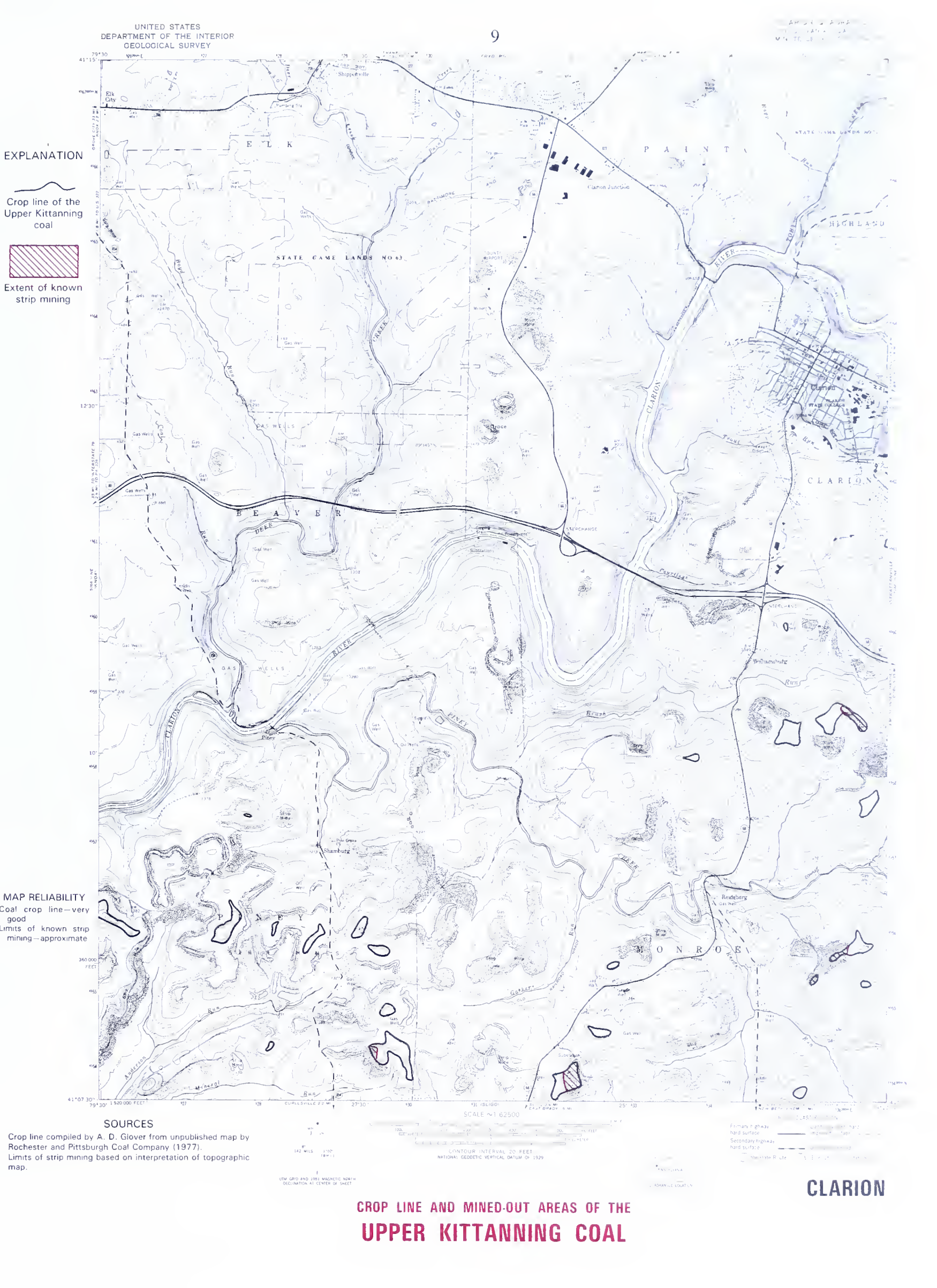
SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER KITTANNING COAL

CLARION







EXPLANATION

 Crop line of the Lower Freeport coal

 Extent of known strip mining

MAP RELIABILITY  
Coal crop line—very good  
Limits of known strip mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



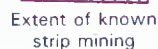
CLARION

CROP LINE AND MINED-OUT AREA OF THE  
LOWER FREEPORT COAL





0  
Crop line of the  
Upper Freeport coal



Coal crop line—very good  
Limits of known strip mining—approximate

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.

BRIDGE

COUNTDOWN INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway hard surface	Light duty road hard surface
Secondary highway hard surface	Unimproved road

Interstate Road      U.S. Route      State Road

## CLARION

## CRDP LINE AND MINED-OUT AREA OF THE UPPER FREEPORT COAL





# EXPLANATION

## CROP LINES

Upper Freeport coal

Lower Freeport coal

Upper Kittanning coal

Middle Kittanning coal

Lower Kittanning coal

Upper Clarion coal

Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge.

Syncline  
Showing axial-plane trace  
and direction of plunge.

—1500—

Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet.

## MAP RELIABILITY

Coal crop lines—very good

Structure contours—very good

## SOURCE

Crop lines slightly modified and structure contours modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).



# COAL CROP LINES AND STRUCTURE CONTOURS

CLARION





EXPLANATION

Crop line of the  
Lower Clarion coal

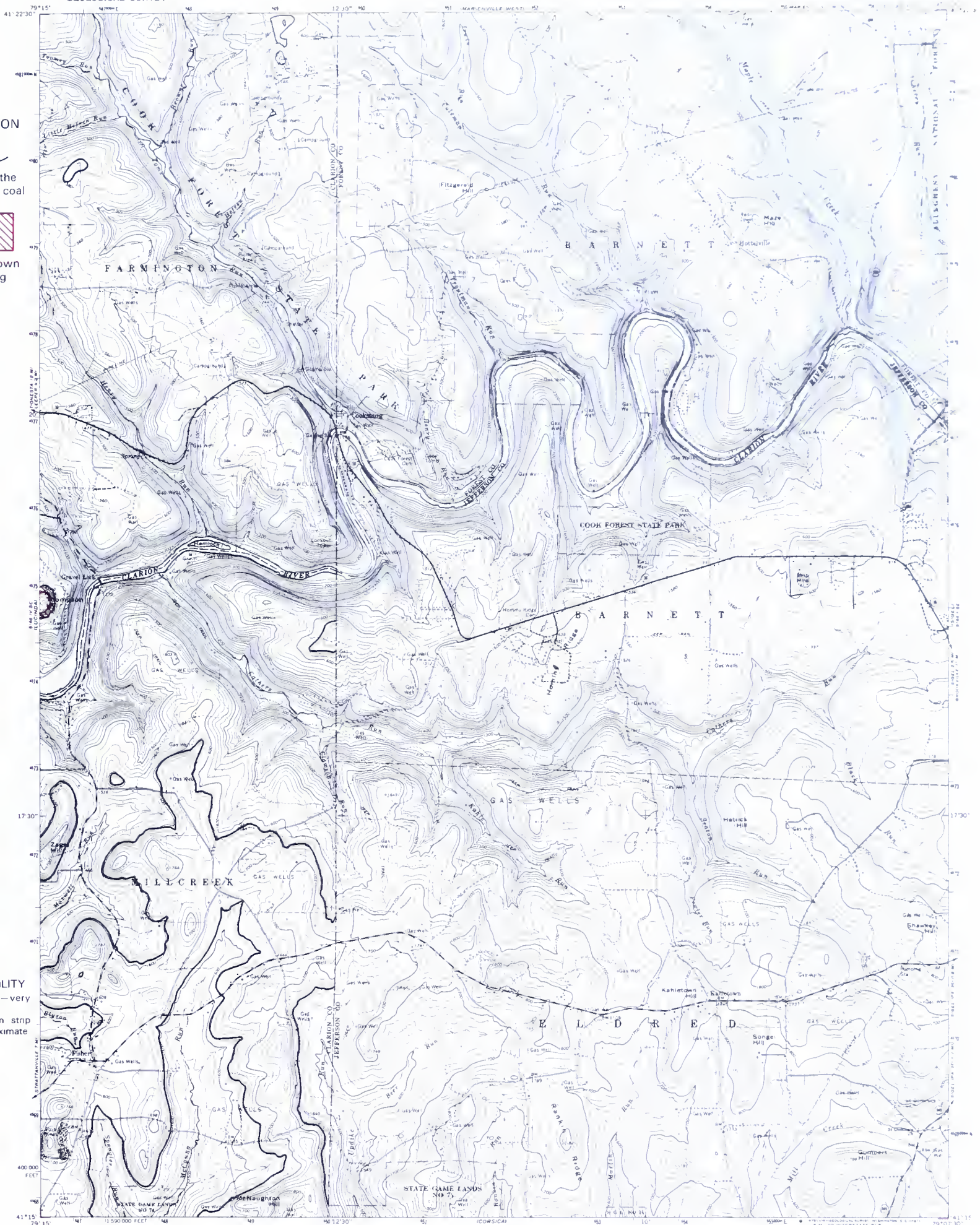
Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Primary highway, all weather  
Secondary highway, all weather  
Light duty road, all weather  
Unimproved road, all weather  
Unimproved road, dry or dry weather  
State Route

U.S. D. 1963 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

PENNSYLVANIA  
QUADRANGLE LOCATION

COOKSBURG

CROP LINE AND MINED-OUT AREA OF THE  
LOWER CLARION COAL











EXPLANATION

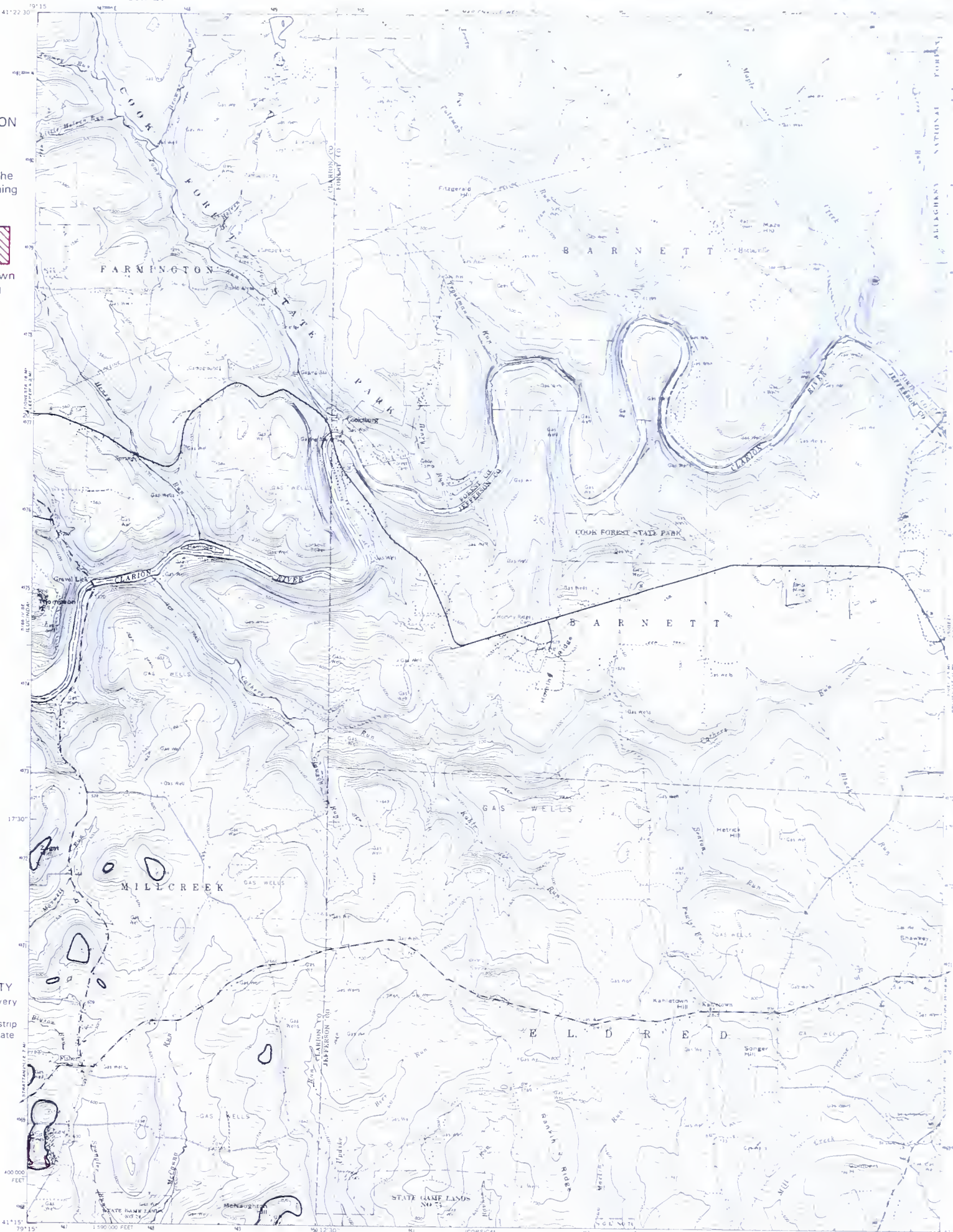
Crop line of the  
Middle Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Primary highway all-weather hard surface  
Secondary highway all-weather hard surface  
Light-duty road all-weather improved surface  
Unimproved road fair-weather  
State Route

COOKSBURG

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL





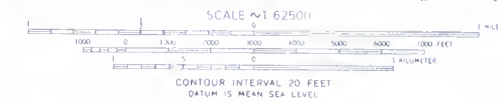
EXPLANATION

0  
Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION

Primary highway, all weather	Light-duty road, all weather
hard surface	improved surface
Secondary highway, all weather	Unimproved road, fair or dry
hard surface	weather
	State Route

COOKSBURG

CROP LINE OF THE  
UPPER KITTANNING COAL







EXPLANATION

CROP LINES

uk  
Upper Kittanning coal

mk  
Middle Kittanning coal

lk  
Lower Kittanning coal

lcl  
Lower Clarion coal



Syncline  
Showing axial plane trace and direction of plunge.

-1600-

Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

MAP RELIABILITY

Coal crop lines—very  
good  
Structure contours—  
very good

SOURCE

Crop lines and structure contours compiled by A. D. Glover from  
unpublished map by Rochester and Pittsburgh Coal Company  
(1977). Crop lines slightly modified by A. D. Glover

Scale 1:50,000



CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Primary highway at weather  
hard surface  
Secondary highway at weather  
hard surface  
Improved road at weather  
hard surface  
State Rte

1:50,000 and 1:25,000 scale  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

ANNEX 1  
QUADRANGLE, COOKBURG

COOKBURG

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal



Extent of known  
strip mining



Extent of known  
deep mining

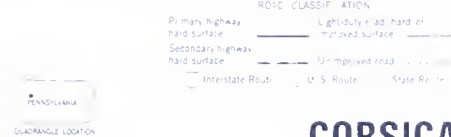
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.

1976 GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL

CORSICA





EXPLANATION

Crop line of the  
Lower Kittanning  
coal



Extent of known  
strip mining



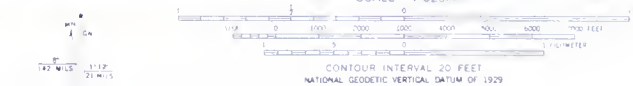
Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps



ROAD CLASSIFICATION	
Primary highway hard surface	Light duty road, hard or improved surface
Secondary highway hard surface	Unimproved road
Interstate Route	U.S. Route
	State Route

CORSICA

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL





EXPLANATION

Crop line of the  
Middle Kittanning  
coal



Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION  
Primary highway  
hard surface  
Secondary highway  
hard surface  
Interstate Route  
Light duty road, hard  
improved surface  
Unimproved road  
State Route  
Sign A-1

CORSICA

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL



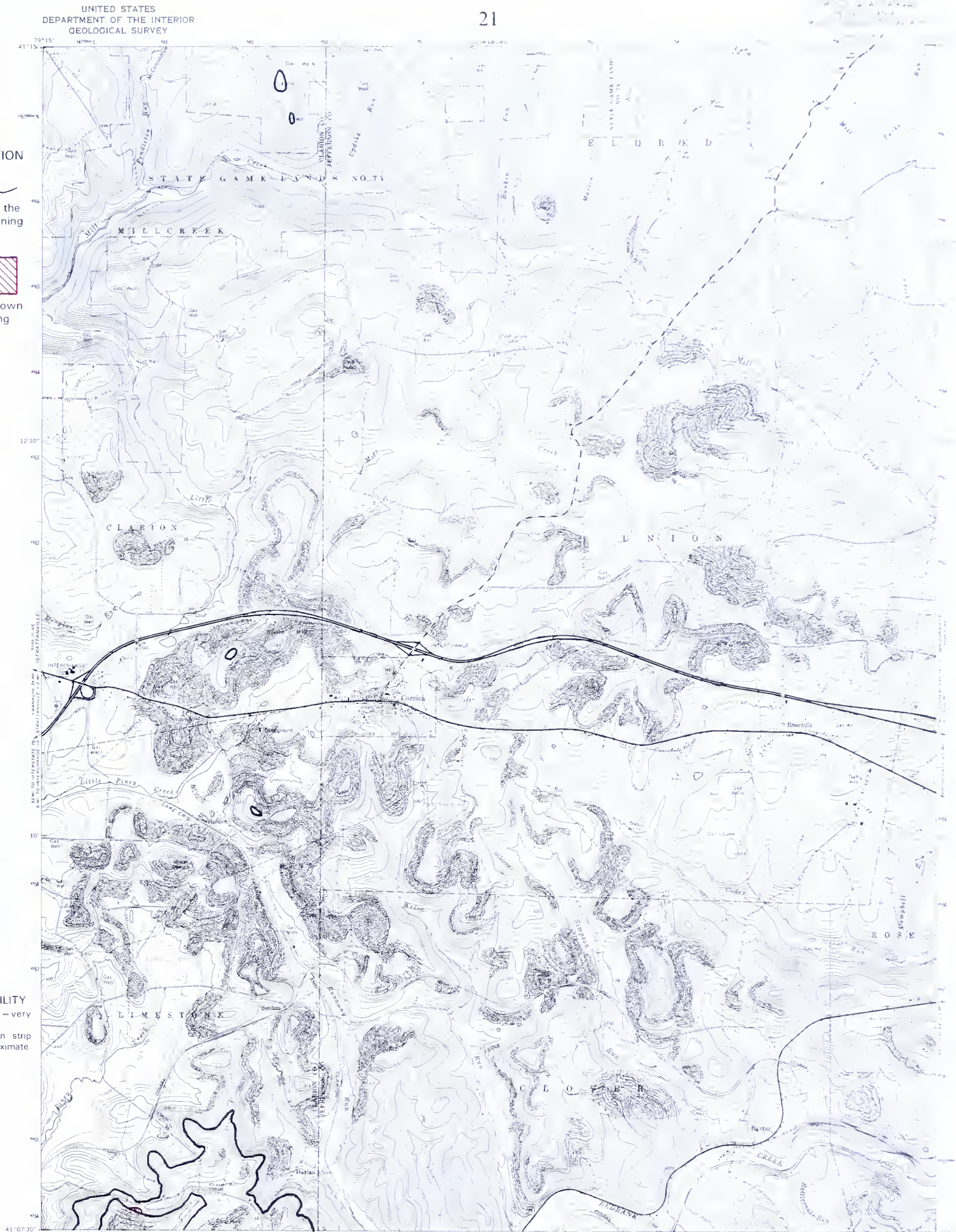


EXPLANATION

 Crop line of the Upper Kittanning coal

 Extent of known strip mining

MAP RELIABILITY  
Coal crop line—very good  
Limits of known strip mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.



ROAD CLASSIFICATION  
Primary highway  
hard surface  
Secondary highway  
hard surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

**CORSICA**

**CROP LINE AND MINED-OUT AREA OF THE  
UPPER KITTANNING COAL**





EXPLANATION

Crop line of the  
Lower Freeport coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).

UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Primary highway  
Secondary highway  
Interstate highway  
Light duty road, hard  
improved surface  
Light improved road  
State

CORSICA

CROP LINE OF THE  
LOWER FREEPORT COAL







EXPLANATION

Crop line of the  
Upper Freeport coal



Extent of known  
strip mining

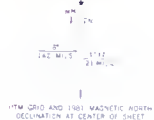
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

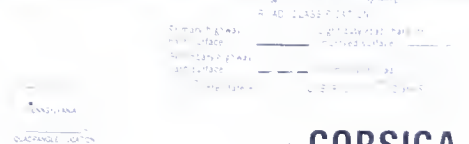
SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

1983 GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



SCALE 1:625,000  
NATIONAL GEODETIC VERTICAL DATUM OF 1929  
ELEVATION INTERVAL 25 FEET



CROP LINE AND MINED-OUT AREAS OF THE  
UPPER FREEPORT COAL

CORSICA





# EXPLANATION

## CROP LINES

- uf—  
Upper Freeport coal
- lf—  
Lower Freeport coal
- uk—  
Upper Kittanning coal
- mk—  
Middle Kittanning coal
- lk—  
Lower Kittanning coal
- lcl—  
Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge.

Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good

## SOURCE

Crop lines and structure contours compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977). Crop lines slightly modified by A. D. Glover.

UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE ~1:62,500  
1 2 3 4 5 6 7 8 9 10 11 12  
1000 2000 3000 4000 5000 6000 7000 8000 9000 10000  
FEET  
1 KILOMETER  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Primary highway  
hard surface  
Secondary highway  
hard surface  
Interstate Route  
U.S. Route  
State Route  
Light-duty road, hard  
improved surface  
Unimproved road  
U.S. Route  
State Route

PENNSYLVANIA  
GLADSTONE LOCATION

CORSICA

## COAL CROP LINES AND STRUCTURE CONTOURS





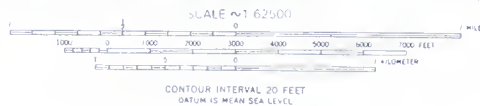
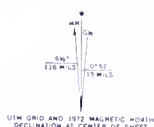
EXPLANATION

  
Crop line of the  
Lower Clarion coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover based on unpublished maps of adjoining quadrangles by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Heavy-duty      Light-duty  
Medium-duty    Unimproved dirt  
U.S. Route      State Route

CROP LINE OF THE  
LOWER CLARION COAL

CRANBERRY

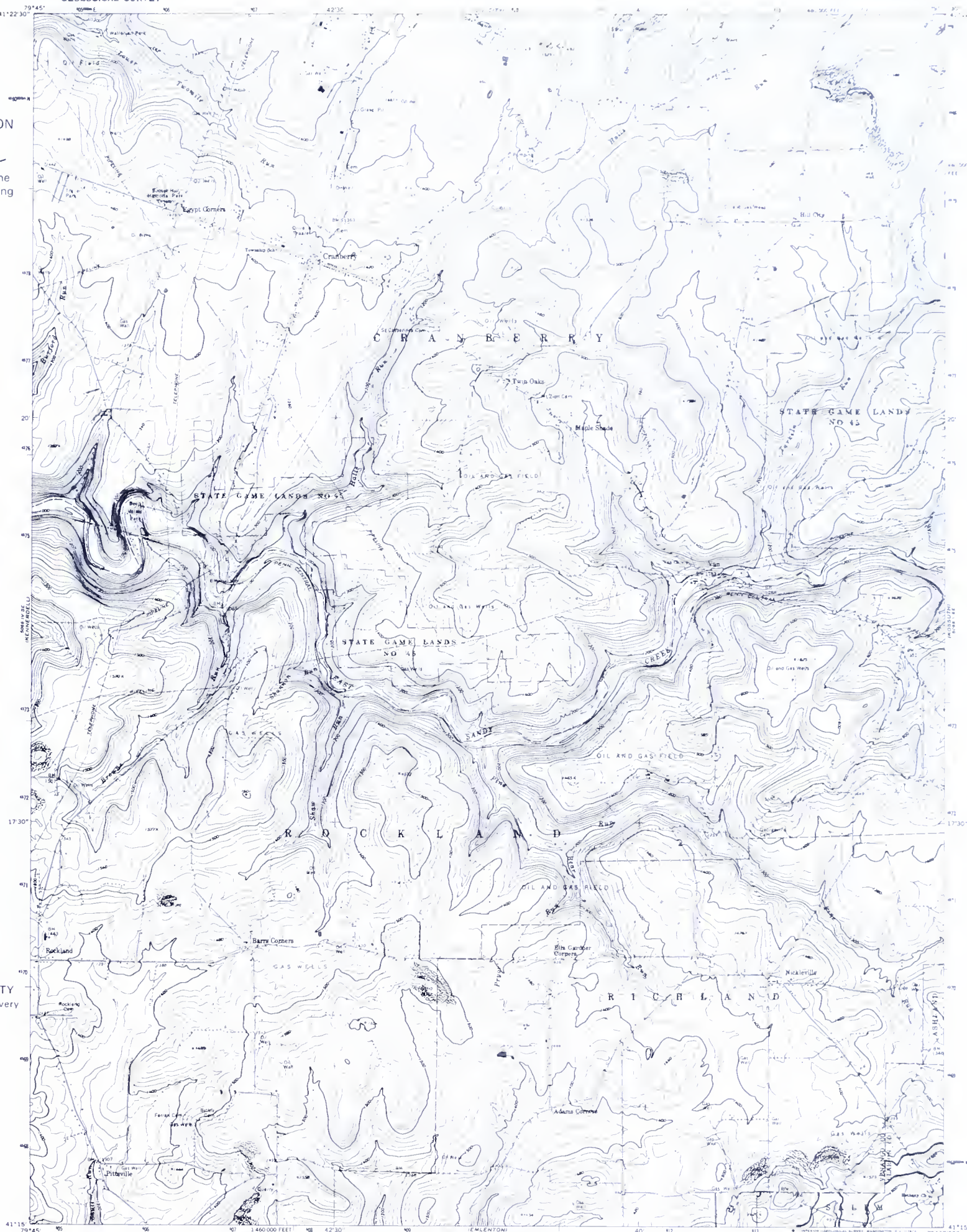




EXPLANATION

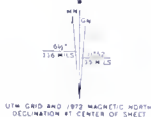
Crop line of the  
Lower Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover based on unpublished maps of adjoining quadrangles by Rochester and Pittsburgh Coal Company (1977).



CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
U.S. Route ——— State Route ———

PENNSYLVANIA  
QUADRANGLE LOCATION

CROP LINE OF THE  
LOWER KITTANNING COAL

CRANBERRY





EXPLANATION

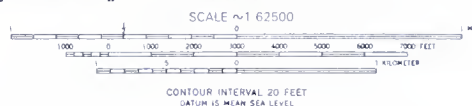
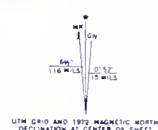
Crop line of the  
Middle Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover based on unpublished maps of adjoining quadrangles by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
U.S. Route ——— State Route ———



CRANBERRY

CROP LINE OF THE  
MIDDLE KITTANNING COAL





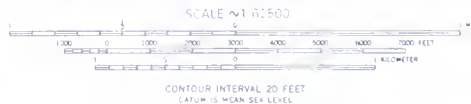
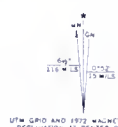
EXPLANATION

Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover based on unpublished maps  
of adjoining quadrangles by Rochester and Pittsburgh Coal Com-  
pany (1977).



ROAD CLASSIFICATION  
Heavy-duty Light-duty  
Medium-duty Unimproved dirt  
U.S. Route State Route

CROP LINE OF THE  
UPPER KITTANNING COAL

CRANBERRY





EXPLANATION

CROP LINES

- uk Upper Kittanning coal
- mk Middle Kittanning coal
- lk Lower Kittanning coal
- lcl Lower Clarion coal

- Syncline  
Showing axial-plane trace  
and direction of plunge

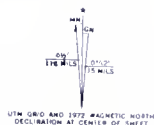
- 1500-  
Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

- MAP RELIABILITY
- Coal crop lines—very good
  - Structure contours—very good



SOURCE

Crop lines and structure contours compiled by A. D. Glover based on unpublished maps of adjoining quadrangles by Rochester and Pittsburgh Coal Company (1977).



- ROAD CLASSIFICATION
- Heavy-duty ——— Light-duty ———
  - Medium-duty ——— Unimproved dirt ———
  - U.S. Route ——— State Route ———



CRANBERRY

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal

MAP RELIABILITY  
Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).



CROP LINE OF THE  
LOWER CLARION COAL

DISTANT





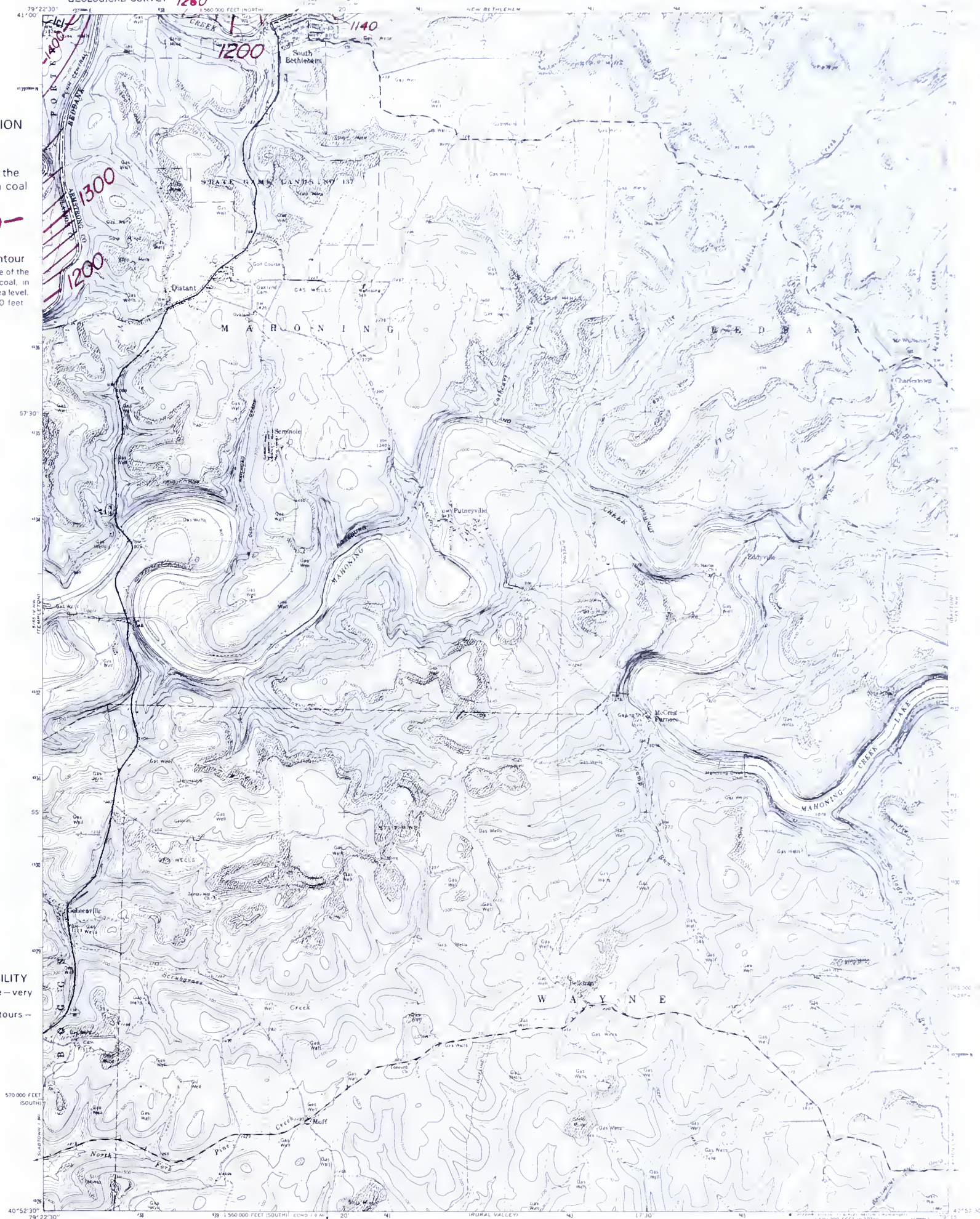
EXPLANATION

Crop line of the  
Lower Clarion coal

-1400-

Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet

MAP RELIABILITY  
Coal crop line—very  
good  
Structure contours—  
very good



SOURCE

Crop line and structure contours compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).

UTM GRID AND 1973 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500  
1 000 0 1 000 2 000 3 000 4 000 5 000 6 000 7 000 8 000 9 000 10 000 FEET  
1 000 0 1 000 2 000 3 000 4 000 5 000 6 000 7 000 8 000 9 000 METERS  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

PENDULUM  
QUADRANGLE LOCATION

ROAD CLASSIFICATION  
Primary highway hard surface  
Secondary highway hard surface  
Interstate Route  
Light duty road hard improved surface  
Unimproved road  
U. S. Route  
State Route

DISTANT

COAL CROP LINE AND  
STRUCTURE CONTOURS







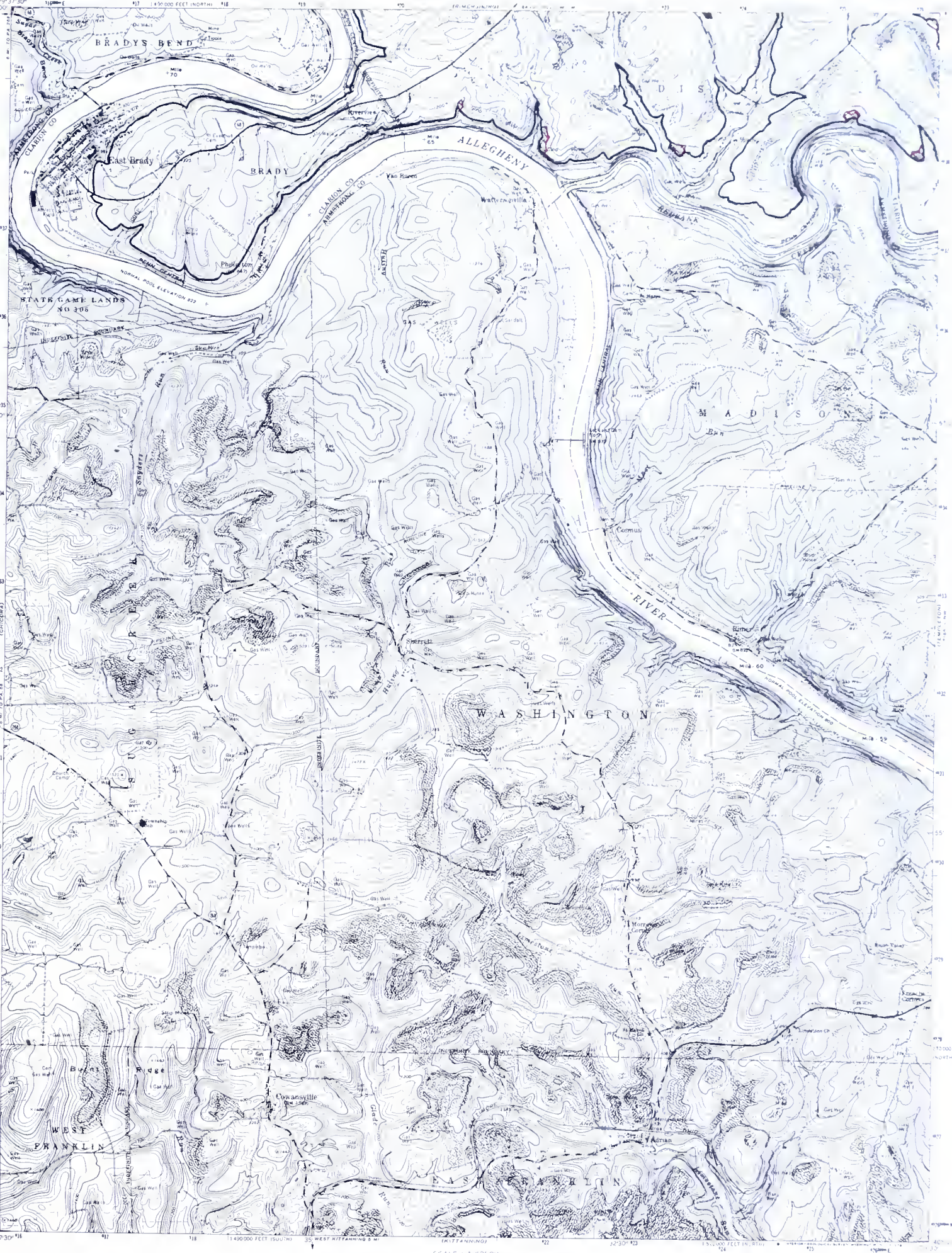
EXPLANATION

Crop line of the  
Lower Clarion coal



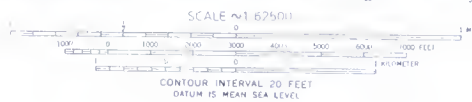
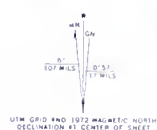
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Heavy duty ————  
Medium duty ————  
Light duty ————  
Unimproved dirt ————  
State Route ————

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL

EAST BRADY





EXPLANATION

Crop line of the  
Lower Kittanning  
coal

Extent of known  
strip mining

Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

EAST BRADY





EXPLANATION

Crop line of the  
Middle Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map



ROAD CLASSIFICATION  
Heavy duty ————  
Medium duty ————  
Light duty ————  
Unimproved dirt ————  
State Route ————

EAST BRADY

CROP LINE AND MINED-OUT AREA OF THE  
MIDDLE KITTANNING COAL







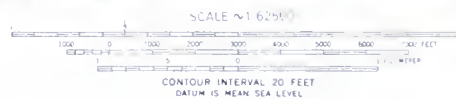
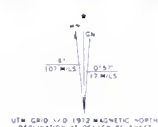
EXPLANATION

Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION

Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
State Route ○

CROP LINE OF THE  
UPPER KITTANNING COAL

EAST BRADY





EXPLANATION

Crop line of the  
Lower Freeport coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).

UTM GRID AND 1972 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION

Heavy duty Light duty  
Met. unimproved or improved or  
State Road

CROP LINE OF THE  
LOWER FREEPORT COAL

EAST BRADY





EXPLANATION

Crop line of the  
Upper Freeport coal



Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1972 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER FREEPORT COAL

EAST BRADY





EXPLANATION

CROP LINES

- uf—  
Upper Freeport coal
- lf—  
Lower Freeport coal
- uk—  
Upper Kittanning coal
- mk—  
Middle Kittanning coal
- lk—  
Lower Kittanning coal
- lcl—  
Lower Clarion coal



Syncline

Showing axial-plane trace  
and direction of plunge

—1200—

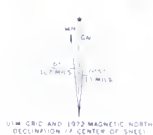
Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good



SOURCE

Crop lines and structure contours slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).



SCALE 1:62,500  
CONTOUR INTERVAL 20 FEET  
DATUM: MEAN SEA LEVEL

ROAD CLASSIFICATION  
Heavy duty  
Medium duty  
Unimproved dirt  
State Route

EAST BRADY

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal



Extent of known  
strip mining



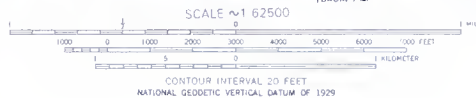
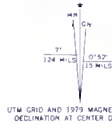
Extent of known  
deep mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map  
and unpublished data.  
Limits of deep mining from unpublished mine maps.



ROAD CLASSIFICATION  
Heavy duty ——— Light duty ———  
Medium duty ——— Unimproved dirt ———  
○ Interstate Route ○ State Route

QUADRANGLE LOCATION

EMLENTON

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

Crop line of the  
Upper Clarion coal



Extent of known  
strip mining

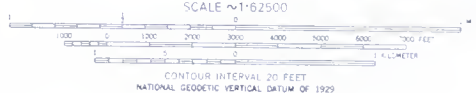
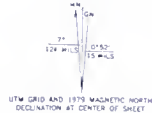
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map  
and unpublished data.



ROAD CLASSIFICATION  
Heavy-duty Light-duty  
Medium-duty Unimproved dirt  
Interstate Route State Route

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER CLARION COAL

EMLENTON





EXPLANATION

Crop line of the  
Lower Kittanning  
coal

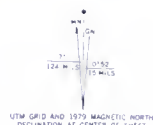
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

EMLETON





EXPLANATION

Crop line of the  
Middle Kittanning coal



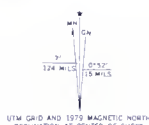
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



SCALE 1:62,500  
1 2 3 4 5 6 7 8 9 10 11 12  
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000  
0 1 2 3 4 5 6 7 8 9 10  
1 KILOMETER  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Heavy duty ——— Light duty ———  
Medium duty ——— Unimproved dirt ———  
Interstate Route ——— State Route ———

EMLENTON

CROP LINE AND MINED-OUT AREA OF THE  
MIDDLE KITTANNING COAL







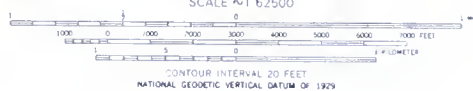
EXPLANATION

Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
Interstate Route ——— State Route ———

EMLENTON

CROP LINE OF THE  
UPPER KITTANNING COAL





EXPLANATION

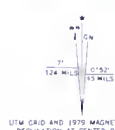
Crop line of the  
Lower Freeport coal

MAP RELIABILITY  
Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).



SCALE ~1:62,500  
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET  
1 2 3 4 5 6 7 8 9 10 KILOMETERS  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Heavy-duty Light-duty  
Medium-duty Unimproved dirt  
Interstate Route State Route

EMLENTON

CROP LINE OF THE  
LOWER FREEPORT COAL





EXPLANATION

CROP LINES

Lower Freeport coal

Upper Kittanning coal

Middle Kittanning coal

Lower Kittanning coal

Upper Clarion coal

Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge.

Syncline  
Showing axial-plane trace  
and direction of plunge

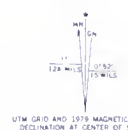
Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good



SOURCES

Crop lines compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977); some crop lines modified by A. D. Glover.  
Structure contours slightly modified by C. H. Dodge from unpublished map by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Heavy duty ——— Light duty ———  
Medium duty ——— Unimproved dirt ———  
Interstate Route ——— State Route ———

EMLENTON

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal



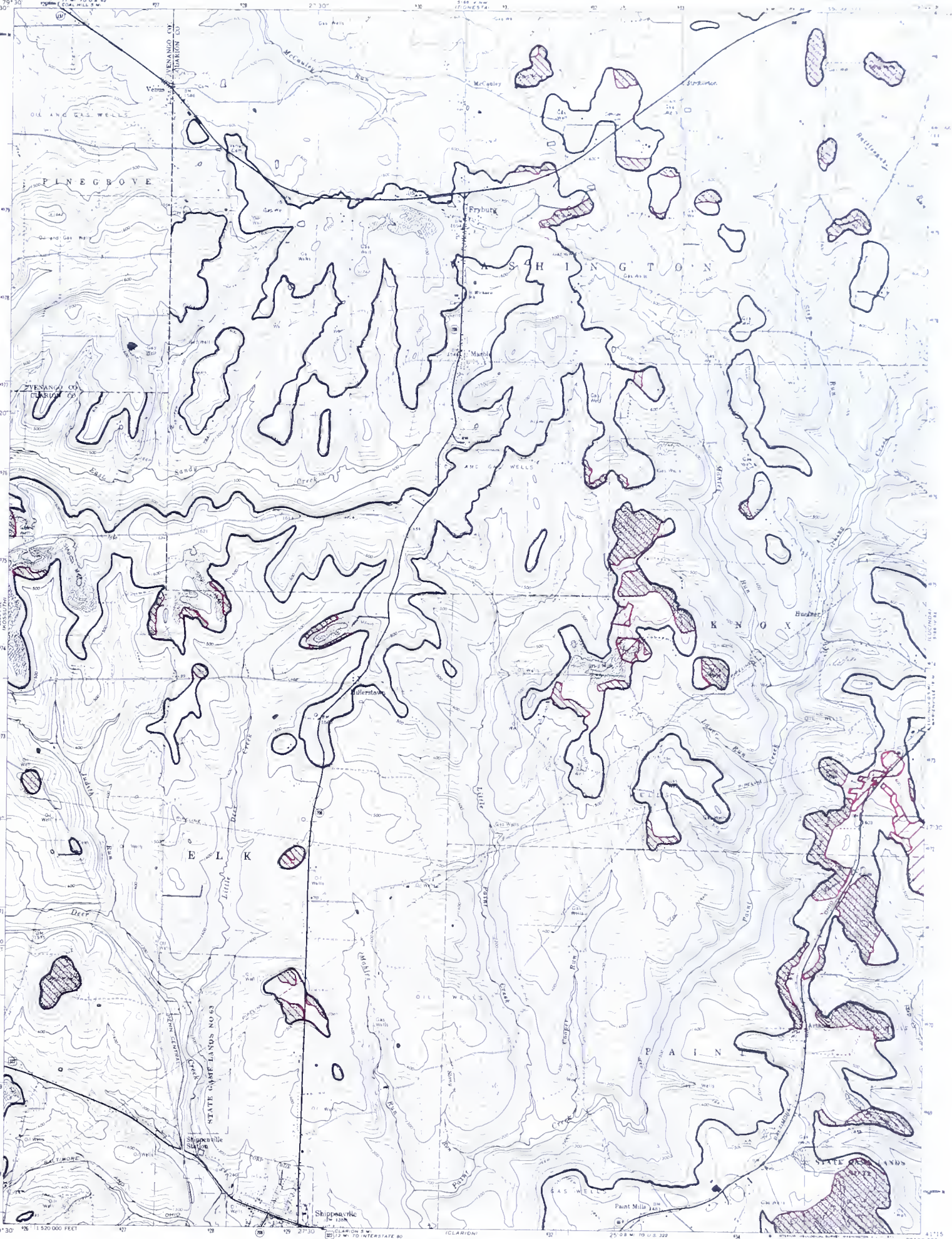
Extent of known  
strip mining



Extent of known  
deep mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map  
and unpublished data.  
Limits of deep mining from unpublished mine maps



SCALE 1:62500  
CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION  
Primary highway all weather, Light duty road all weather  
hard surface improved surface  
Unimproved road fair or dry  
weather  
U.S. Route State Route



FRYBURG

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

Crop line of the  
Upper Clarion coal



Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION  
Primary highway all weather hard surface  
Light duty road all weather improved surface  
Unimproved road fair or dry weather  
U.S. Route  
State Route



CROP LINE AND MINED-OUT AREAS OF THE  
UPPER CLARION COAL

FRYBURG





EXPLANATION

Crop line of the  
Lower Kittanning  
coal

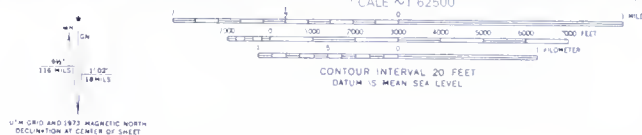
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Primary highway: all weather, hard surface  
Light-duty road: all weather, improved surface  
Unimproved road: fair or dry weather  
U. S. Route  
State Route

FRYBURG

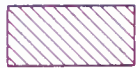
CROP LINE AND MINED-OUT AREA OF THE  
LOWER KITTANNING COAL





EXPLANATION

Crop line of the  
Middle Kittanning  
coal



Extent of known  
strip mining

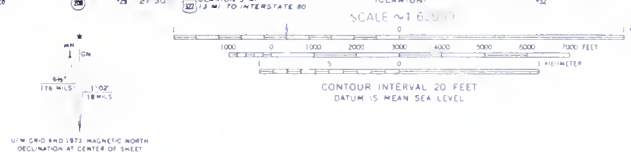
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Primary highway all-weather: Light-duty road, all-weather  
hard surface: Improved surface  
Unimproved road: Fair or dry  
weather: weather  
U.S. Route: U.S. Route  
State Route: State Route



FRYBURG

CROP LINE AND MINED-OUT AREA OF THE  
MIDDLE KITTANNING COAL





EXPLANATION

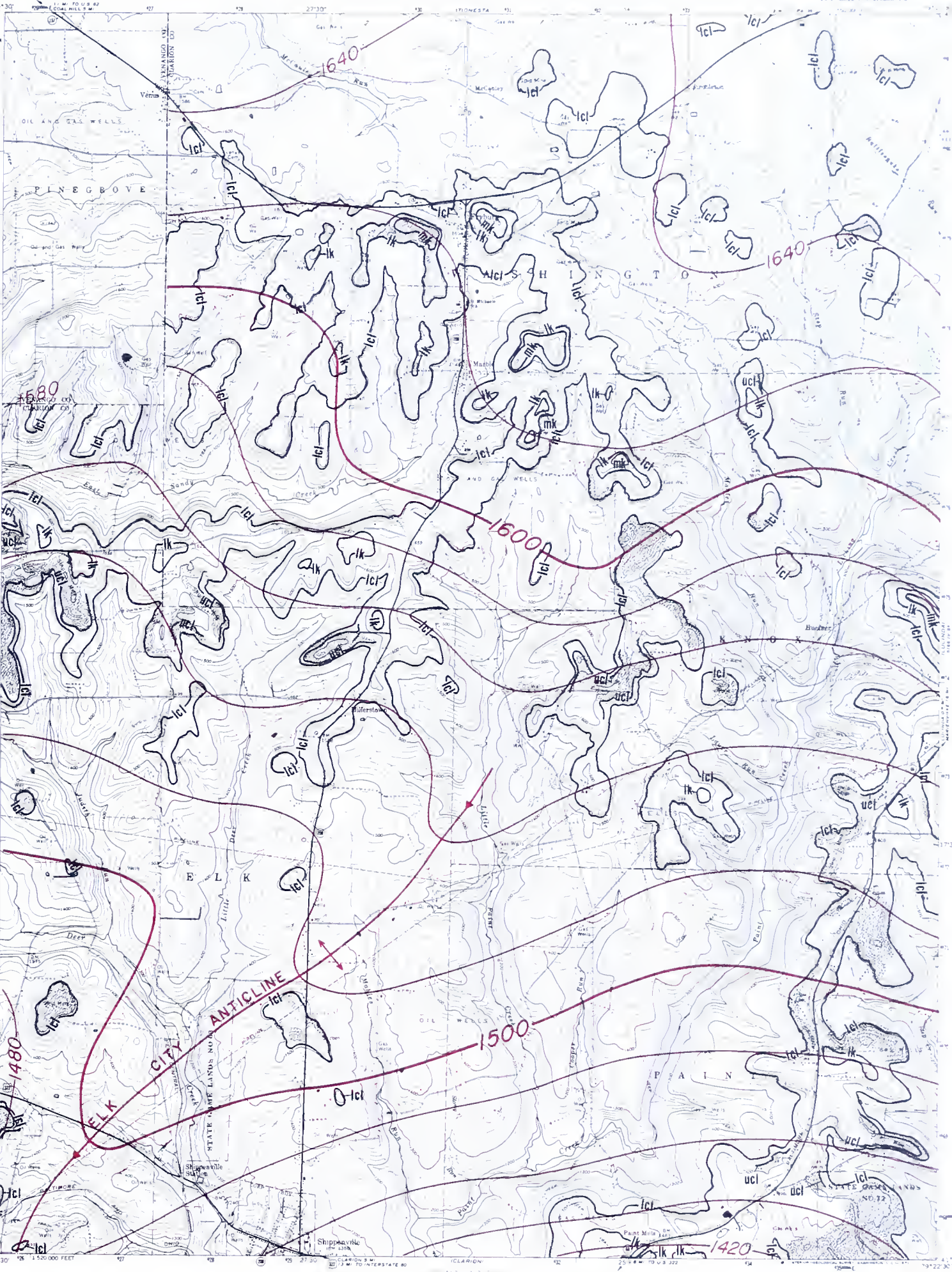
CROP LINES

-  Middle Kittanning coal
-  Lower Kittanning coal
-  Upper Clarion coal
-  Lower Clarion coal

 Anticline  
Showing axial-plane trace  
and direction of plunge

 Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

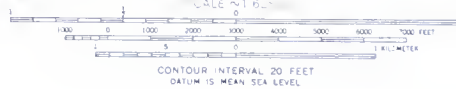
MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good



SOURCE

Crop lines and structure contours slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).

UTM GRID AND 1973 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION  
Primary highway all weather hard surface  
Light-duty road all weather improved surface  
Unimproved road fair or dry weather  
U.S. Route  
State Route



FRYBURG

COAL CROP LINES AND  
STRUCTURE CONTOURS







Extent of known  
strip mining

[illegible]

UTM GRID AND 1972 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Heavy-duty: State Rule  
 Medium-duty: Interstate Rule

**KNOX**

## CROP LINE AND MINED-OUT AREAS OF THE LOWER CLARION COAL







EXPLANATION

Crop line of the  
Upper Clarion coal



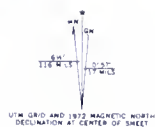
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
○ State Route  
○ Interstate Route



KNOX

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER CLARION COAL





EXPLANATION

Crop line of the  
Lower Kittanning  
coal

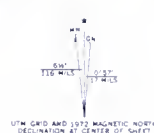
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Heavily  
Medium  
Lightly  
Unimproved  
State Route  
Interstate Route

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

KNOX





EXPLANATION

Crop line of the  
Middle Kittanning  
coal

Extent of known  
strip mining

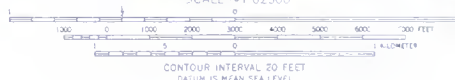
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.



ROAD CLASSIFICATION  
Heavy-duty ————  
Medium-duty ————  
Light-duty ————  
Unimproved dirt ————  
State Route ————  
Interstate Route ————

PENNSYLVANIA  
QUADRANGLE LOCATION

KNOX

CROP LINE AND MINED OUT AREAS OF THE  
MIDDLE KITTANNING COAL





EXPLANATION

Crop line of the  
Upper Kittanning  
coal

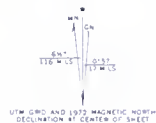
MAP RELIABILITY

Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Heavy-duty  
Medium-duty  
Light-duty  
Unimproved  
State Route  
Hwy. Route

CROP LINE OF THE  
UPPER KITTANNING COAL

KNOX





EXPLANATION

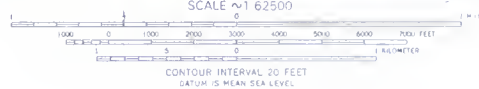
 Crop line of the  
Lower Freeport coal

MAP RELIABILITY  
Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
State Route ———  
Interstate Route ———

QUADRANGLE LOCATION

CROP LINE OF THE  
LOWER FREEPORT COAL

KNOX







EXPLANATION

CROP LINES

Lower Freeport coal

Upper Kittanning coal

Middle Kittanning coal

Lower Kittanning coal

Upper Clarion coal

Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge

Syncline  
Showing axial-plane trace  
and direction of plunge

Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good

SOURCE

Crop lines and structure contours compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977). Crop lines slightly modified by A. D. Glover




# COAL CROP LINES AND STRUCTURE CONTOURS

KNOX





EXPLANATION

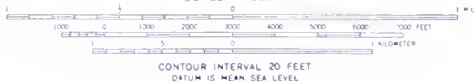
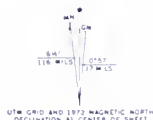
- Crop line of the  
Lower Clarion coal
-  Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.



ROAD CLASSIFICATION

Heavy duty ——— Light duty ———  
Medium duty ——— Unimproved dirt ———

 U.S. Route  State Route

KOSSUTH

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

 Crop line of the  
Upper Clarion coal



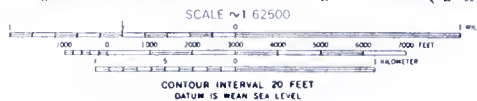
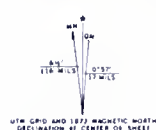
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
U.S. Route —○— State Route —○—



KOSSUTH

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER CLARION COAL





EXPLANATION

Crop line of the  
Lower Kittanning  
coal

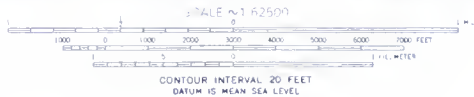
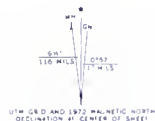


Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map  
and unpublished data



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
U.S. Route ——— State Route ———

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL


KOSSUTH





EXPLANATION

○  
Crop line of the  
Middle Kittanning coal

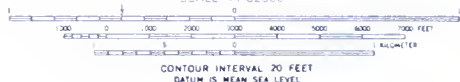
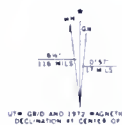
  
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.



CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
□ U. S. Route ○ State Route



KOSSUTH

CROP LINE AND MINED-OUT AREA OF THE  
MIDDLE KITTANNING COAL






EXPLANATION

CROP LINES

- mk—  
Middle Kittanning coal
- lk—  
Lower Kittanning coal
- ucl—  
Upper Clarion coal
- lcl—  
Lower Clarion coal

  
Anticline  
Showing axial-plane trace and direction of plunge.

  
Syncline  
Showing axial-plane trace and direction of plunge.

  
Structure contour  
Altitude of the base of the Lower Clarion coal, in feet above mean sea level. Contour interval 20 feet

MAP RELIABILITY  
Coal crop lines—very good  
Structure contours—very good

SOURCE

Crop lines and structure contours compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977). Some crop lines slightly modified by A. D. Glover.



SCALE 1:62500  
CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty - - - - - Improved dirt . . . . .  
U.S. Route □ State Route ○

PENNSYLVANIA  
QUADRANGLE LOCATION

KOSSUTH

COAL CROP LINES AND  
STRUCTURE CONTOURS







EXPLANATION

Crop line of the  
Lower Clarion coal



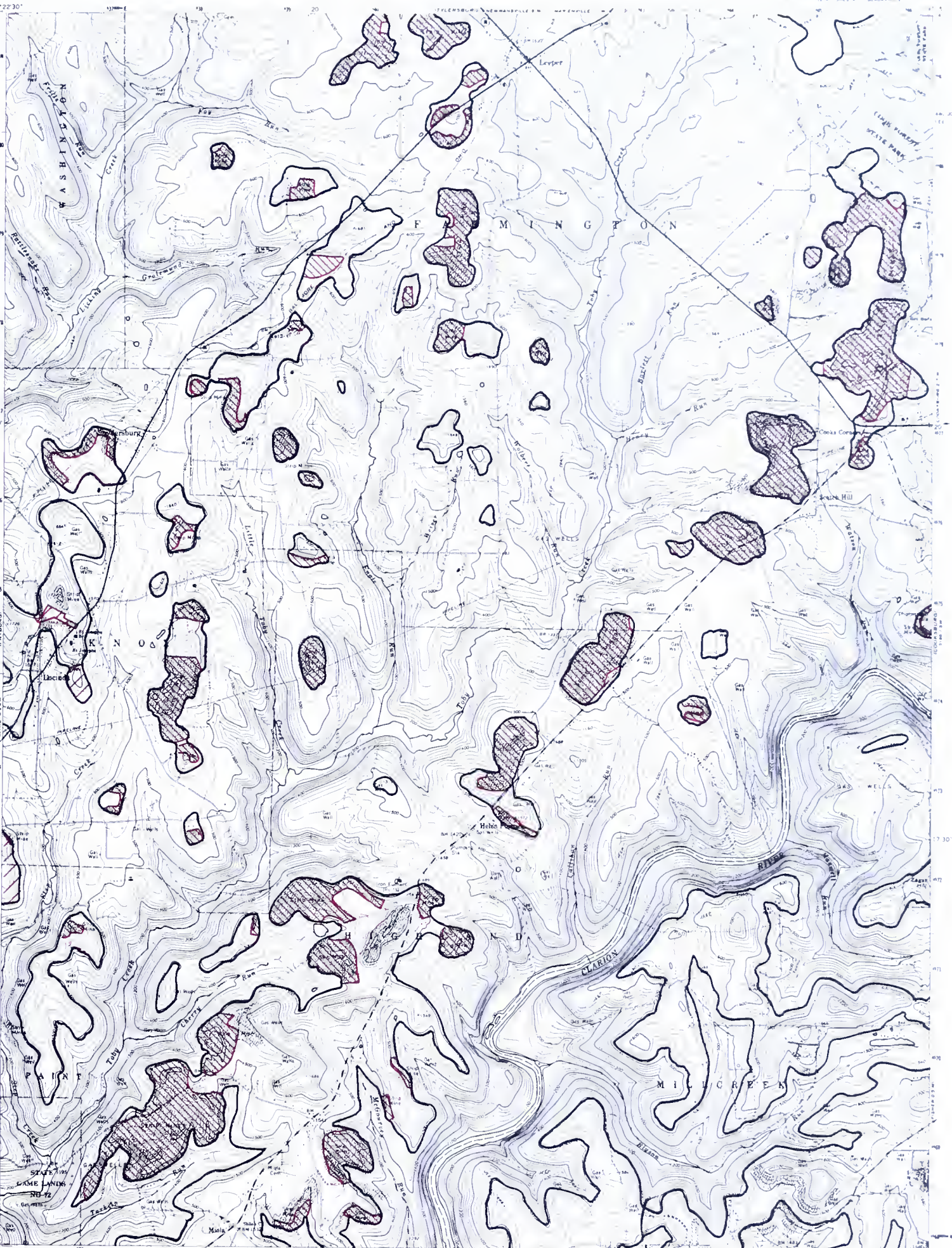
Extent of known  
strip mining



Extent of known  
deep mining

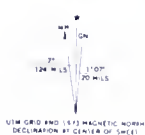
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Primary highway, all weather  
Secondary highway, all weather  
Light-duty road, all weather  
Unimproved road, fair or dry weather  
State Route

LUCINDA

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

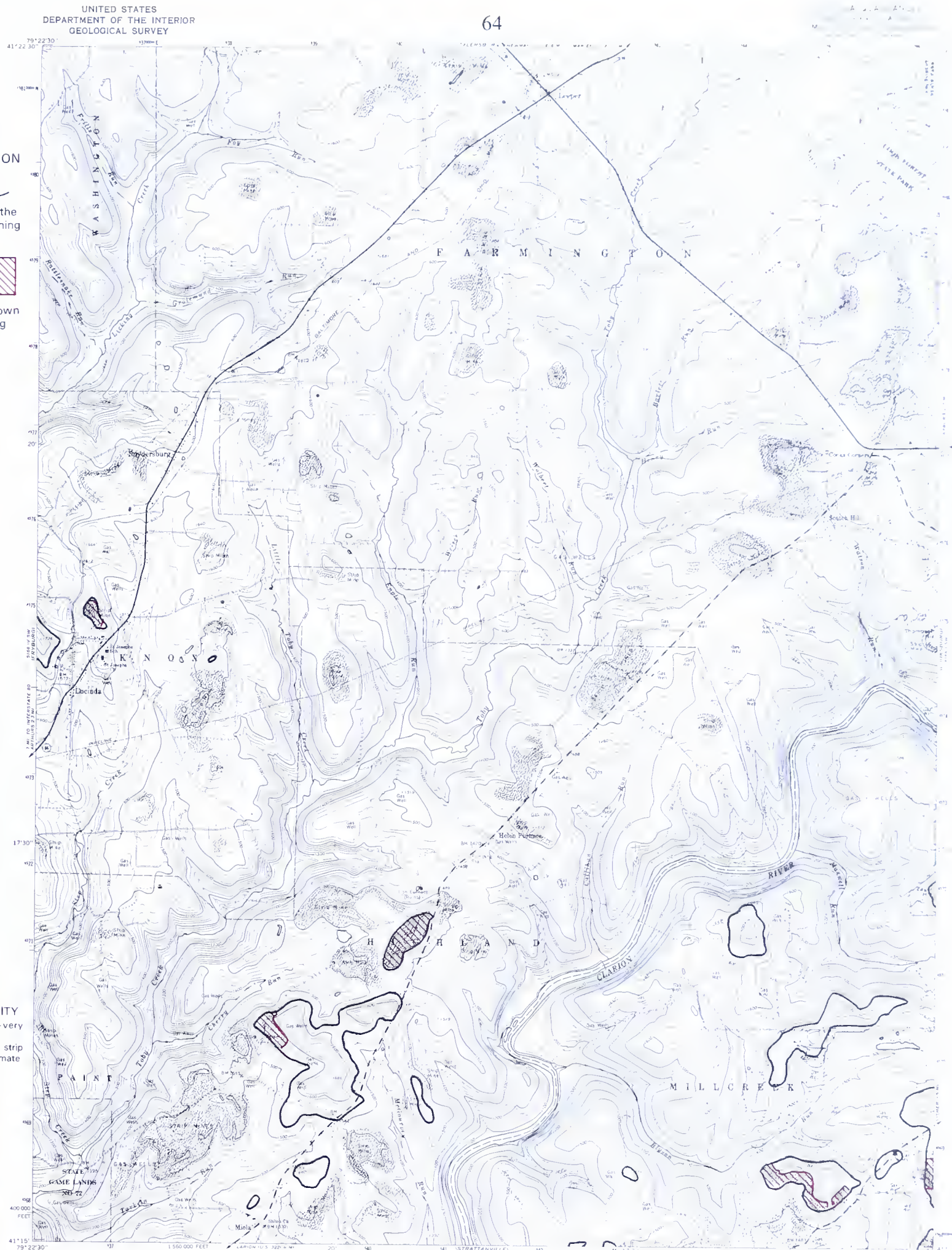
Crop line of the  
Lower Kittanning  
coal



Extent of known  
strip mining

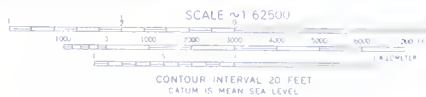
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION

Primary highway all-weather	Light-duty road all-weather
Hard surface	Unimproved surface
Secondary highway all-weather	Unimproved road all-weather
Hard surface	Weather
	State Route

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

LUCINDA





EXPLANATION

Crop line of the  
Middle Kittanning  
coal

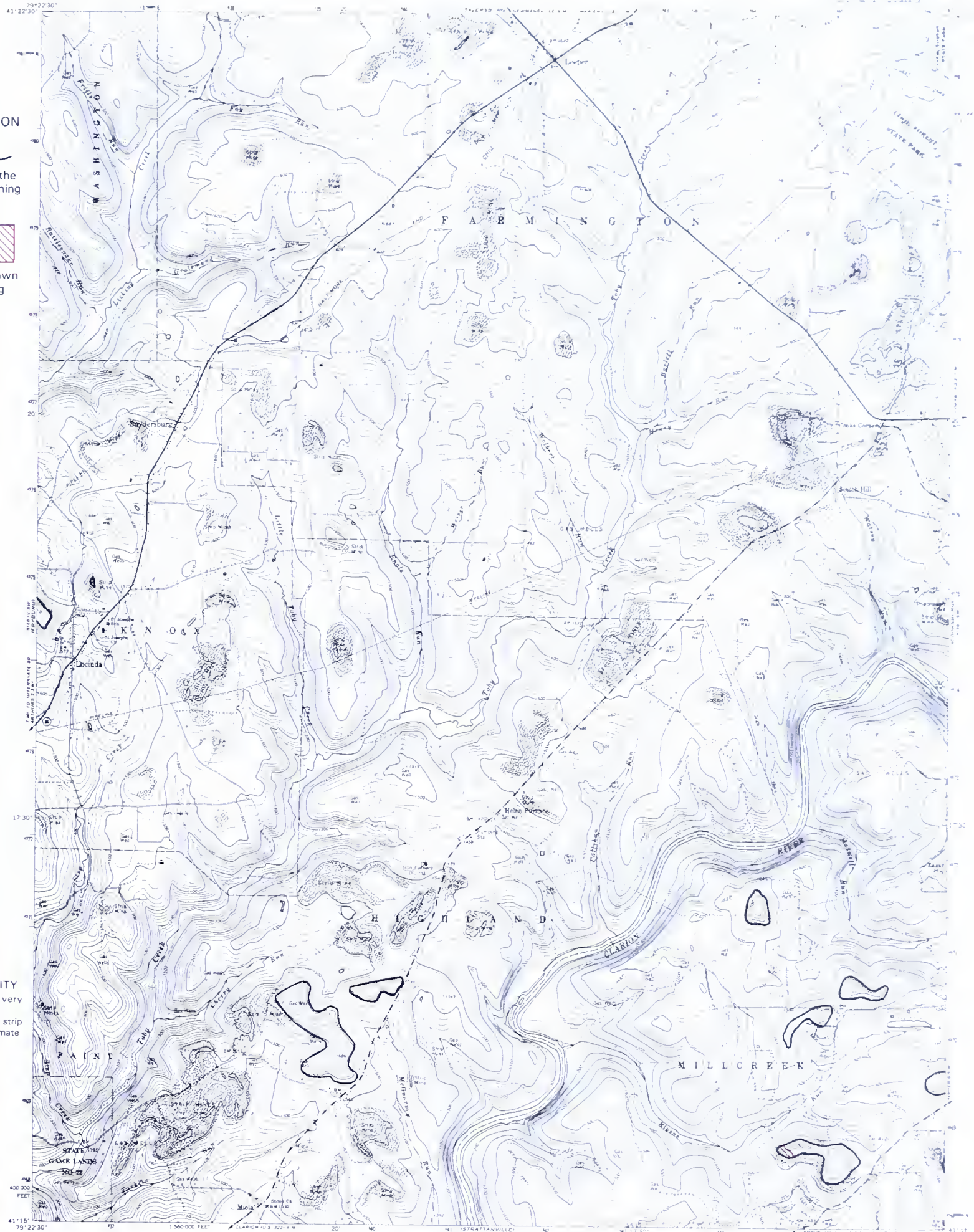


Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good

Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1913 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION  
Primary highway all weather light duty road all weather  
hard surface improved road all weather  
Secondary highway all weather improved road all weather  
hard surface weather  
State Route

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL

LUCINDA





EXPLANATION

  
Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good



SOURCE

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION  
Primary highway all-weather  
Hard surface  
Secondary highway all-weather  
Unimproved road farm only  
weather  
State Route

79° 22' 30" W. 31° 42' 30" N. NORTH  
SECTIONAL CENTER OF SHEET

CROP LINE OF THE  
UPPER KITTANNING COAL

LUCINDA







EXPLANATION

CROP LINES

- uk—  
Upper Kittanning coal
- mk—  
Middle Kittanning coal
- lk—  
Lower Kittanning coal
- lcl—  
Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge.

Syncline  
Showing axial-plane trace  
and direction of plunge.

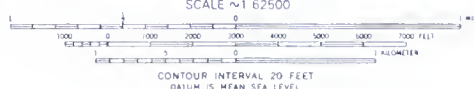
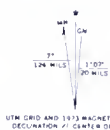
—1600—  
Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good



SOURCE

Crop lines and structure contours slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION

Primary highway, all weather hard surface	Light duty road, all weather improved surface
Secondary highway, all weather hard surface	Unimproved road, fair or dry weather

○ State Route



LUCINDA

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal



Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1973 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:100,000  
CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION  
Primary highway all-weather Light-duty road all-weather  
hard surface improved surface  
Unimproved road fair or dry  
weather  
State Route

PENNSYLVANIA  
QUADRANGLE LOCATION

MARIENVILLE  
WEST

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

Crop line of the  
Lower Clarion coal



Anticline  
Showing axial-plane trace  
and direction of plunge.



Syncline  
Showing axial-plane trace  
and direction of plunge



Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

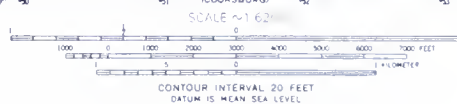
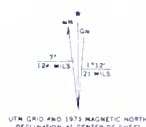
MAP RELIABILITY

Coal crop line—very  
good  
Structure contours—  
very good



SOURCE

Crop line and structure contours compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977). Crop line slightly modified by A. D. Glover.



ROAD CLASSIFICATION  
Primary highway all-weather Light-duty road all-weather  
hard surface improved surface  
Unimproved road for dry  
weather  
State Route



MARIENVILLE  
WEST

COAL CROP LINE AND  
STRUCTURE CONTOURS

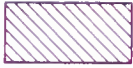






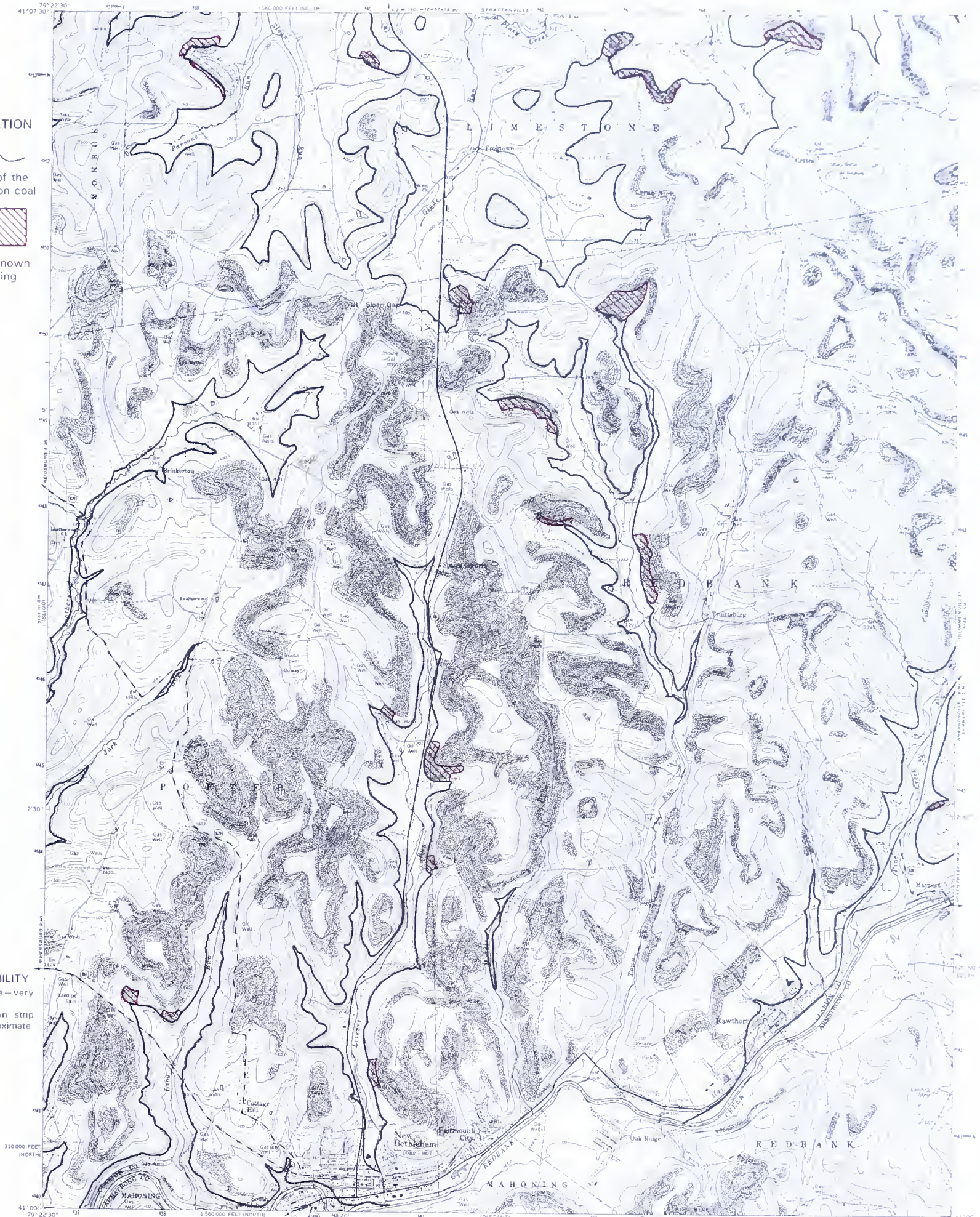
EXPLANATION

Crop line of the  
Lower Clarion coal



Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL

ROAD CLASSIFICATION  
Primary highway  
hard surface  
Secondary highway  
hard surface  
Interstate Route  
U. S. Route  
State Route

NEW  
BETHLEHEM







EXPLANATION

- Crop line of the Lower Kittanning coal
- ▨ Extent of known strip mining
- ▨ Extent of known deep mining

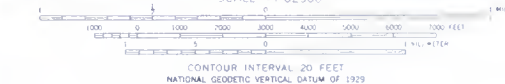
MAP RELIABILITY

- Coal crop line—very good  
Limits of known strip mining—approximate  
Limits of known deep mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.  
Limits of deep mining from unpublished mine maps.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



- ROAD CLASSIFICATION
- Primary highway: hard surface, light-duty road, hard or improved surface, Secondary highway: hard surface, Unimproved road, Interstate Route, U.S. Route, State Route

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

NEW  
BETHLEHEM







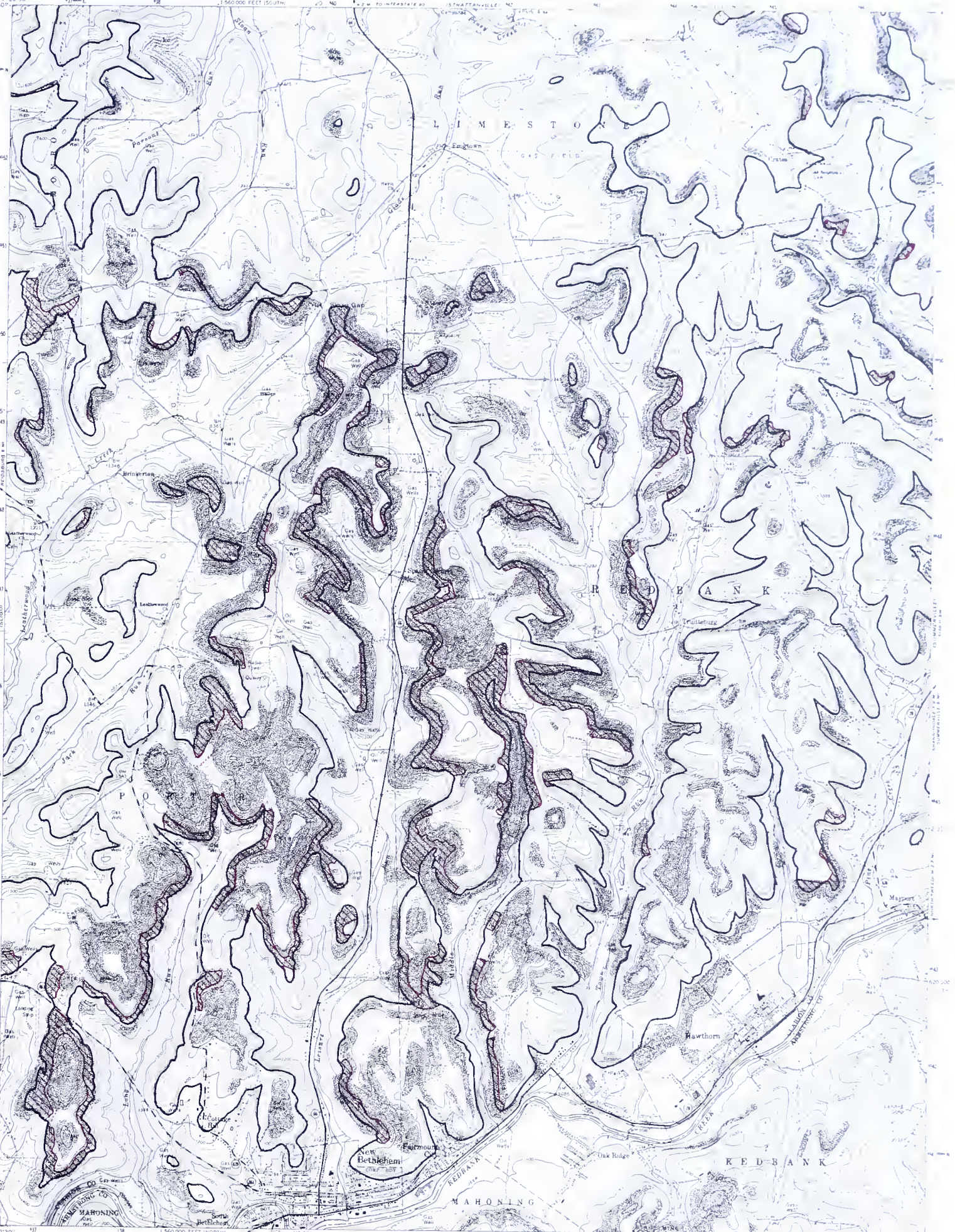
EXPLANATION

Crop line of the  
Middle Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION	
Primary highway hard surface	Lightly used road hard surface
Secondary highway hard surface	Unimproved road
Interstate Route	U.S. Route
	State Route

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL

NEW  
BETHLEHEM





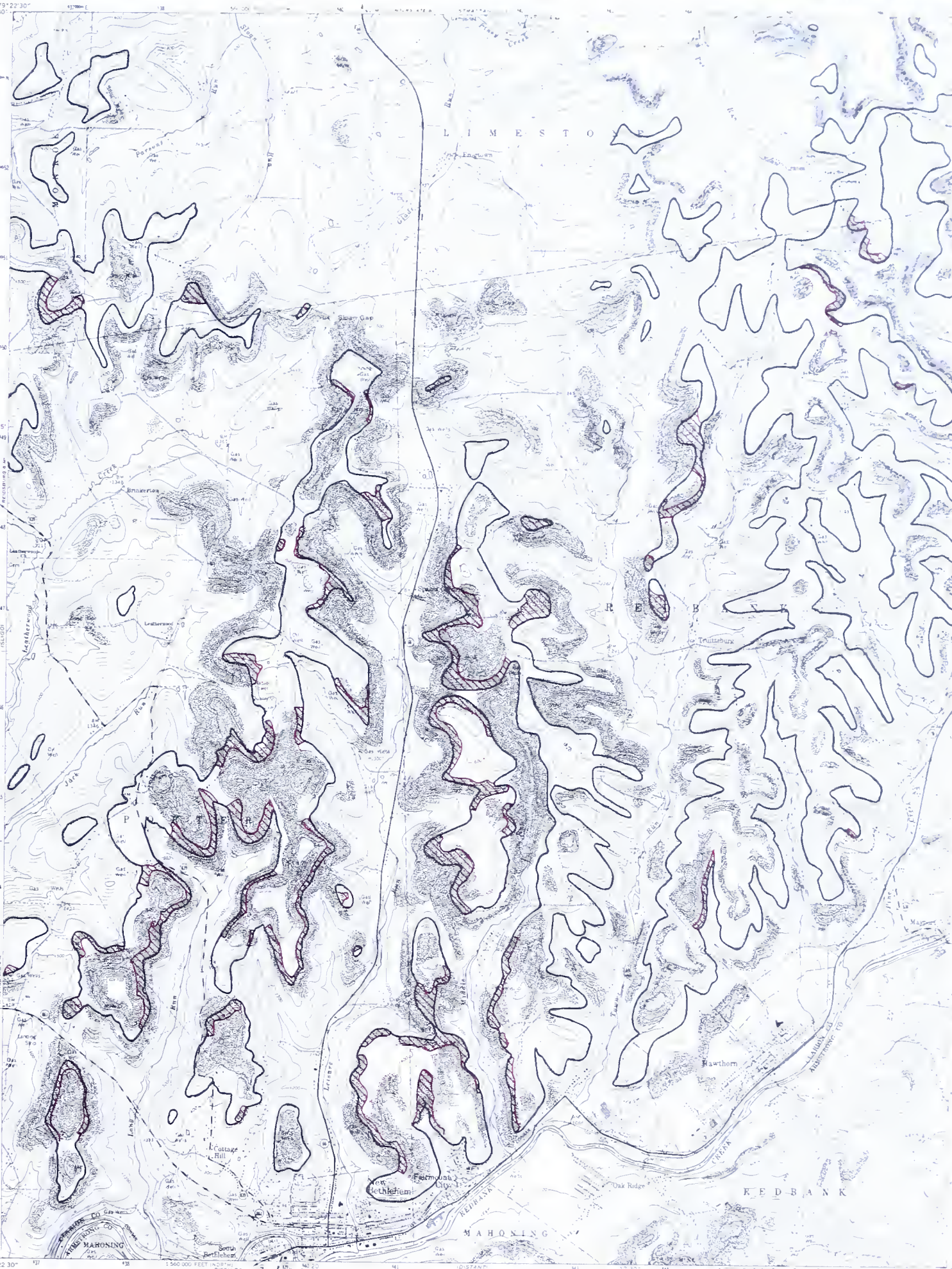
EXPLANATION

Crop line of the  
Upper Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



CROP LINE AND MINED-OUT AREAS OF THE  
UPPER KITTANNING COAL

NEW  
BETHLEHEM





EXPLANATION

Crop line of the  
Lower Freeport coal



Extent of known  
strip mining

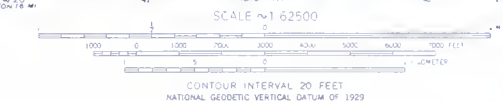
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



CROP LINE AND MINED-OUT AREAS OF THE  
LOWER FREEPORT COAL

NEW  
BETHLEHEM







EXPLANATION

Crop line of the  
Upper Freeport coal



Extent of known  
strip mining



Extent of known  
deep mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



CROP LINE AND MINED-OUT AREAS OF THE  
UPPER FREEPORT COAL

NEW  
BETHLEHEM







EXPLANATION

CROP LINES

- uf—  
Upper Freeport coal
- lf—  
Lower Freeport coal
- uk—  
Upper Kittanning coal
- mk—  
Middle Kittanning coal
- lk—  
Lower Kittanning coal
- lcl—  
Lower Clarion coal

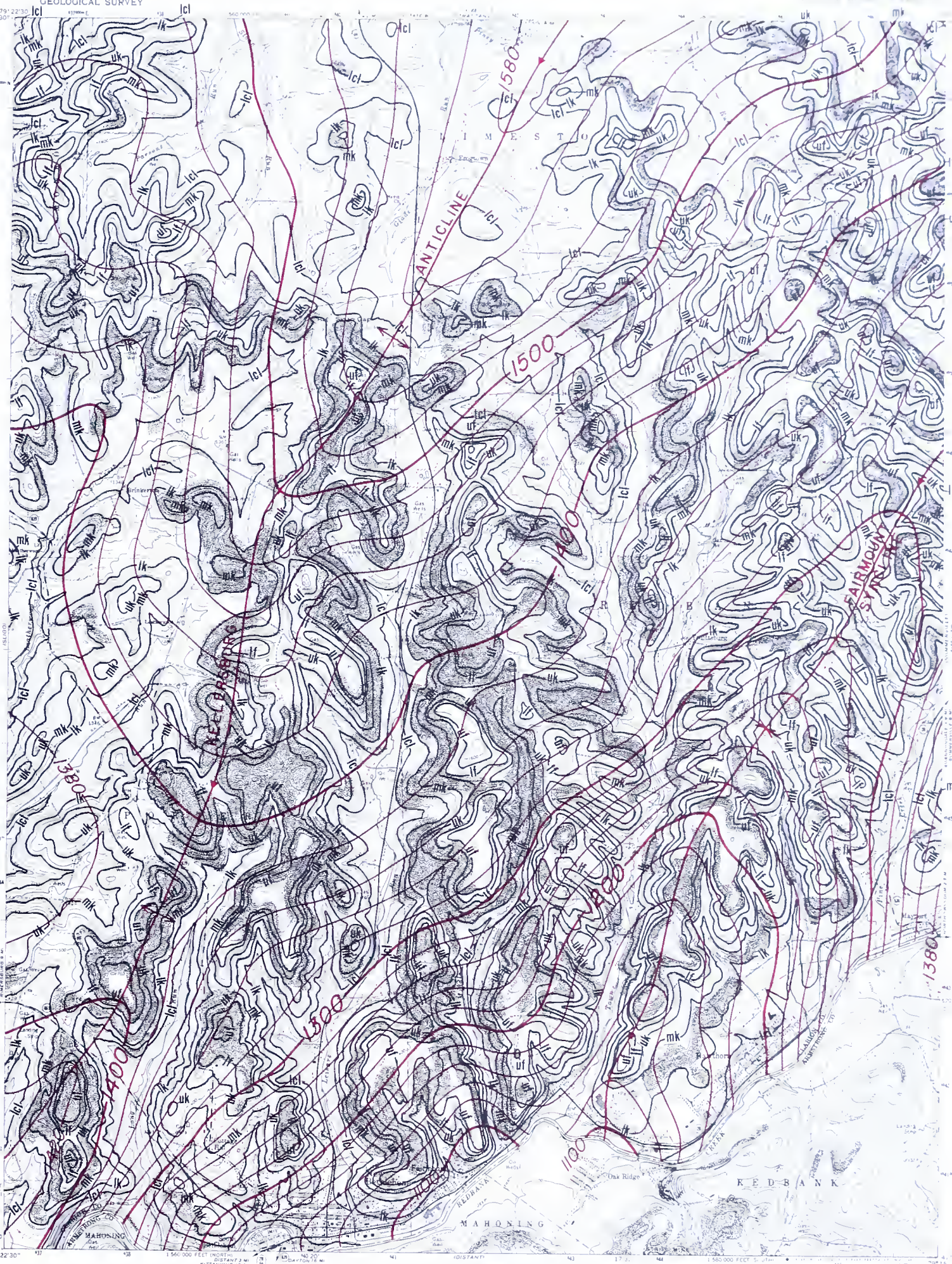
-   
Anticline  
Showing axial-plane trace  
and direction of plunge.

-   
Syncline  
Showing axial-plane trace  
and direction of plunge.

- 1300—  
Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet

MAP RELIABILITY

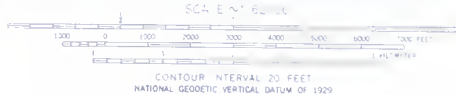
- Coal crop lines—very good
- Structure contours—very good



SOURCE

Crop lines and structure contours slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



- ROAD CLASSIFICATION
- Primary hwy. hard surface
- Secondary hwy. hard surface
- Interstate Route
- U.S. Route
- State Route

# COAL CROP LINES AND STRUCTURE CONTOURS

NEW  
BETHLEHEM





EXPLANATION

Crop line of the  
Lower Clarion coal

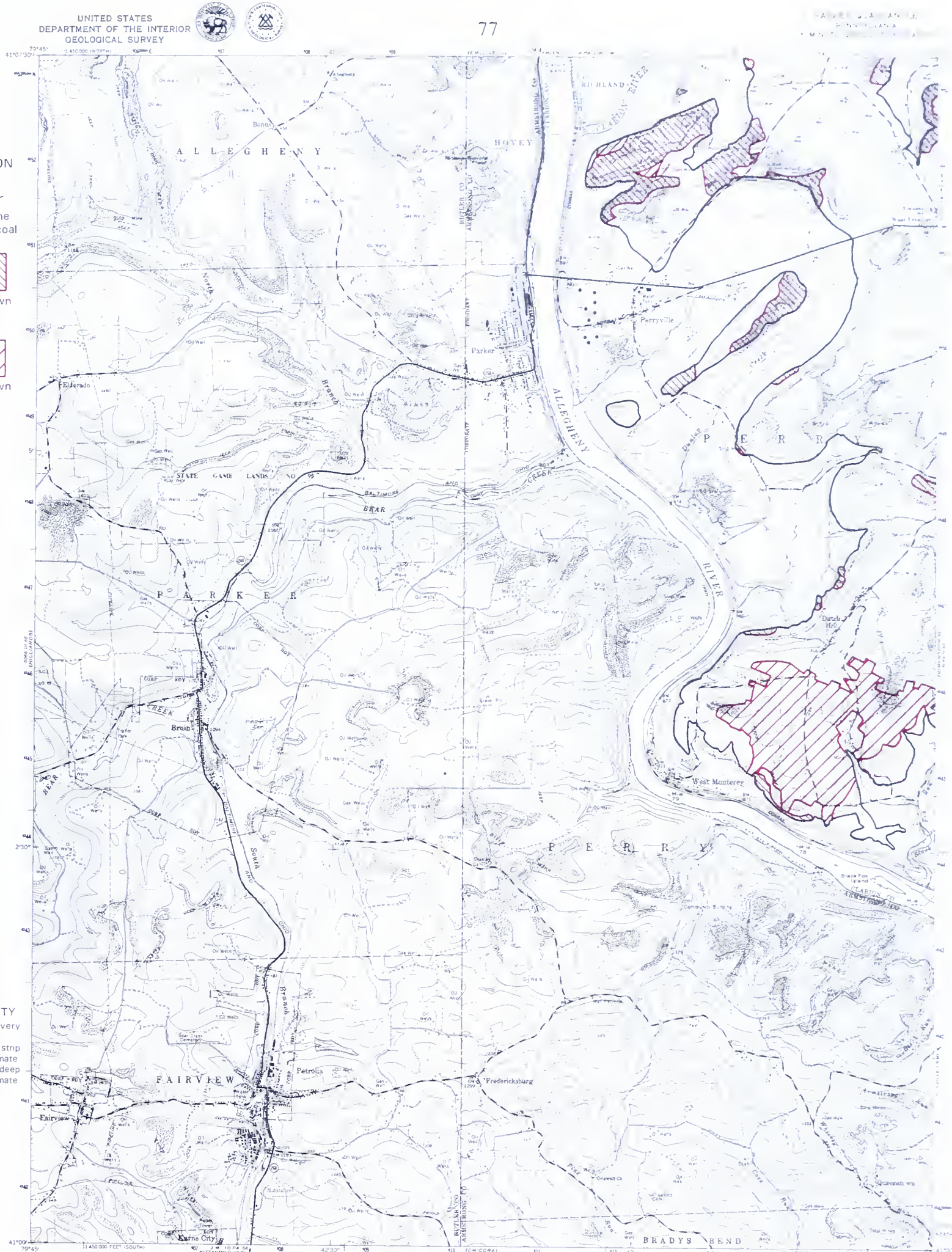


Extent of known  
strip mining



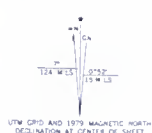
Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburg Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



SCALE  
1:50,000  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Highway  
Main highway  
Improved dirt  
State Route

PARKER

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





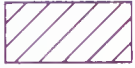


EXPLANATION

Crop line of the  
Lower Kittanning  
coal



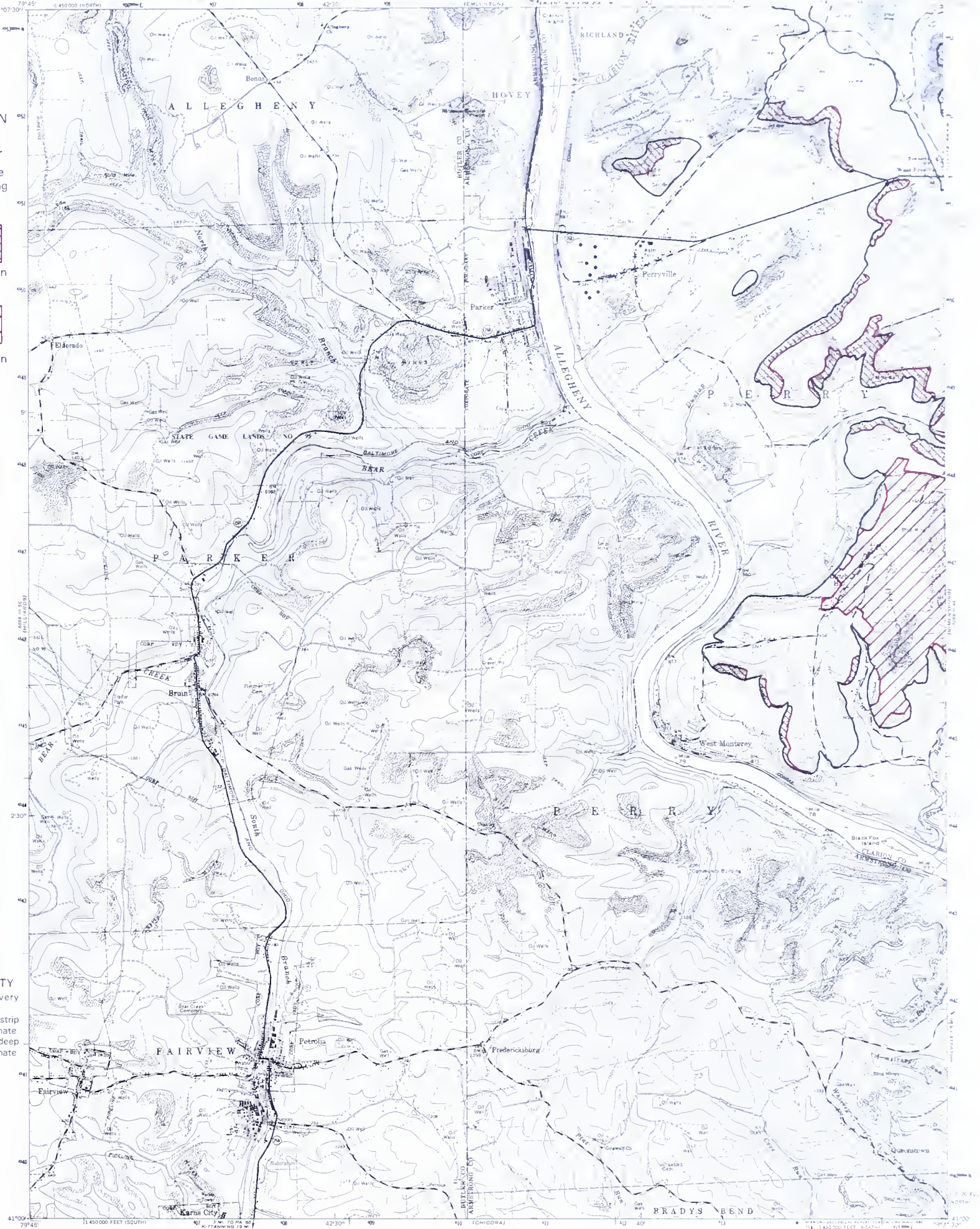
Extent of known  
strip mining



Extent of known  
deep mining

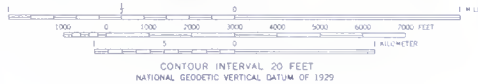
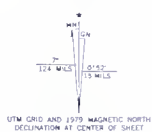
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
State Route ( )

PENNSYLVANIA  
CARBONATE LOCALITY

PARKER

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL







EXPLANATION

Crop line of the  
Middle Kittanning  
coal

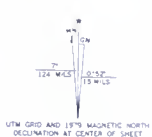
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Major road  
Minor road  
Unimproved road  
State Route

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL

PARKER







EXPLANATION

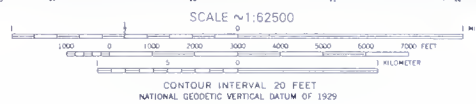
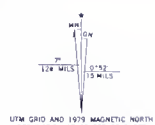
Crop line of the  
Upper Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Heavy-duty ——— Light-duty ———  
Medium-duty ——— Unimproved dirt ———  
○ State Route

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER KITTANNING COAL

PARKER







# EXPLANATION

Crop line of the  
Lower Freeport coal



Extent of known  
strip mining

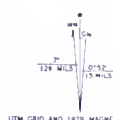
# MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



# SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION	
Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
	State Route



PARKER

# CROP LINE AND MINED-OUT AREAS OF THE LOWER FREEPORT COAL







EXPLANATION

Crop line of the  
Upper Freeport coal



Extent of known  
strip mining

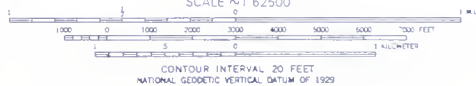
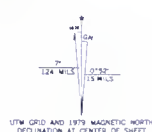
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION	
Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
	State Route



PARKER

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER FREEPORT COAL









EXPLANATION

CROP LINES

- uf Upper Freeport coal
- lf Lower Freeport coal
- uk Upper Kittanning coal
- mk Middle Kittanning coal
- lk Lower Kittanning coal
- lcl Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge.

Syncline  
Showing axial-plane trace  
and direction of plunge.

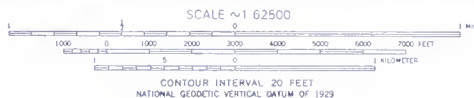
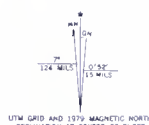
1200  
Structure contour  
Altitude of the base of the  
Lower Clarion coal,  
in feet above mean sea  
level. Contour interval  
20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good



SOURCE

Crop lines slightly modified by A. D. Glover and structure contours slightly modified by A. D. Glover and C. H. Dodge from unpublished map by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION

- Heavy-duty
- Medium-duty
- Light-duty
- Unimproved dirt
- State Route



PARKER

# COAL CROP LINES AND STRUCTURE CONTOURS







EXPLANATION

Crop line of the  
Lower Clarion coal



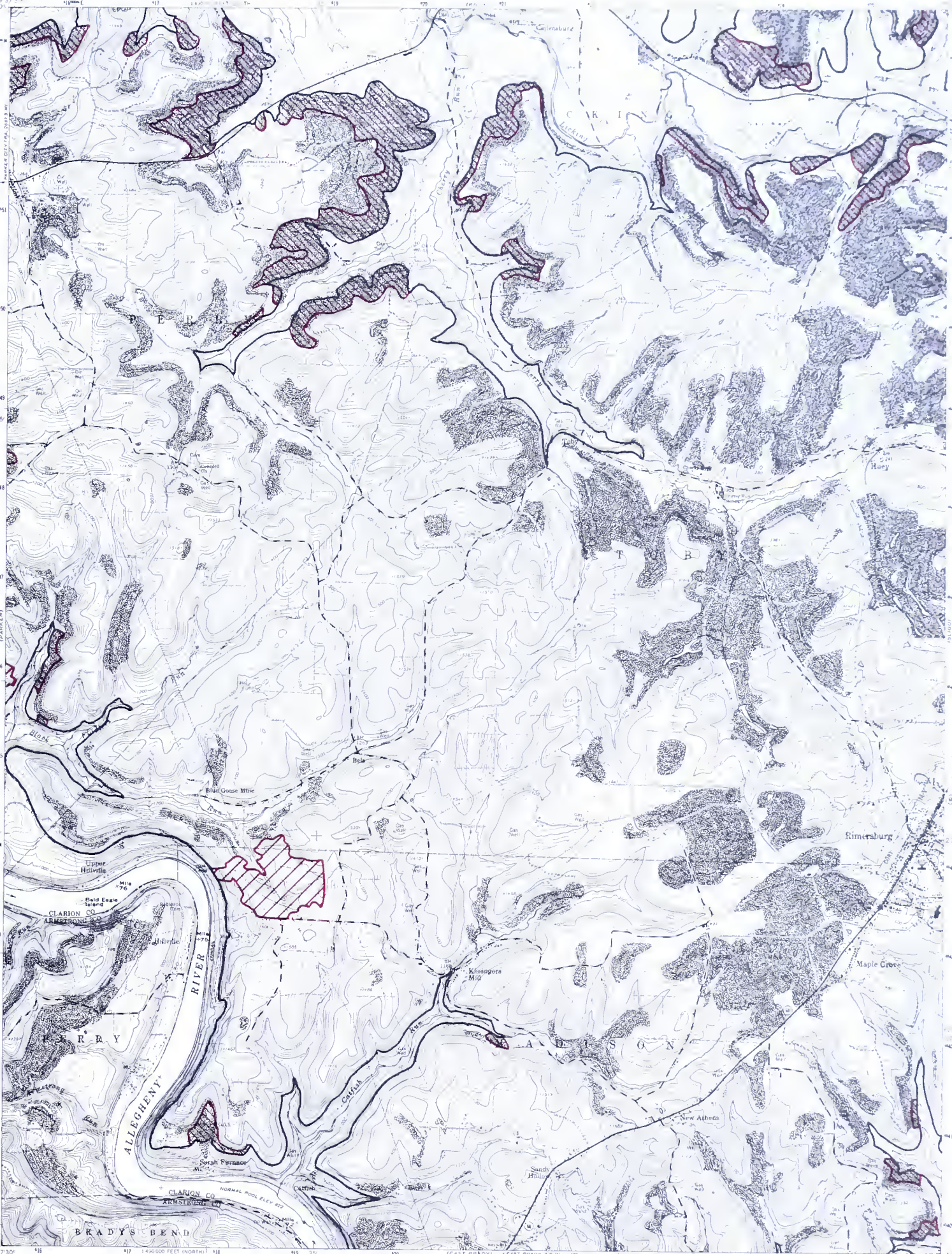
Extent of known  
strip mining



Extent of known  
deep mining

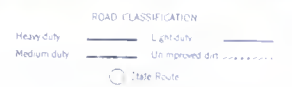
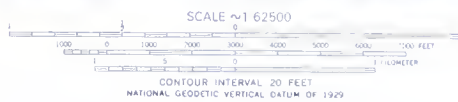
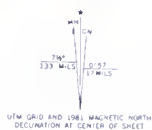
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL

RIMERSBURG







EXPLANATION

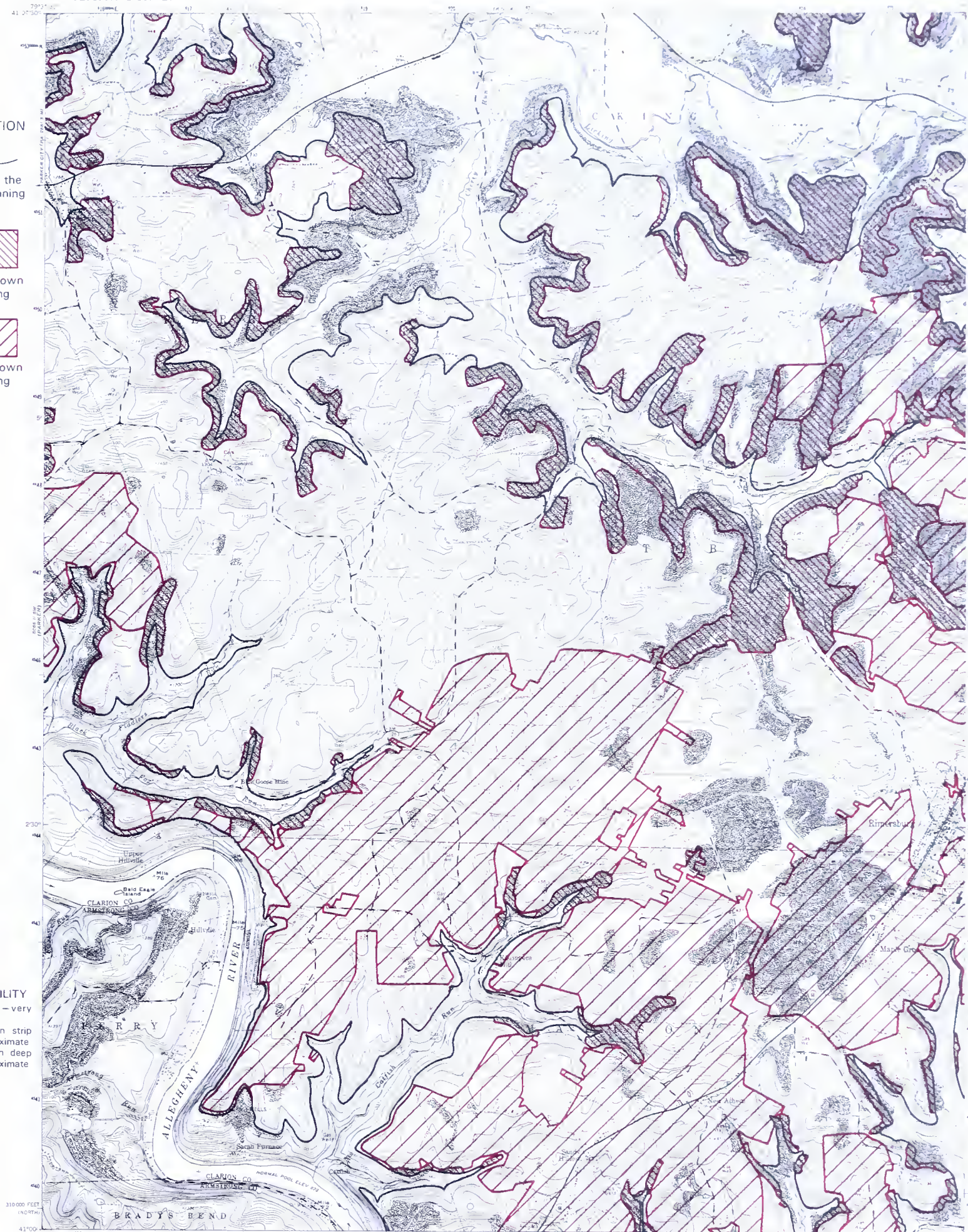
Crop line of the  
Lower Kittanning coal

Extent of known  
strip mining

Extent of known  
deep mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Main Road  
Minor Road  
State Road

RIMERSBURG

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL



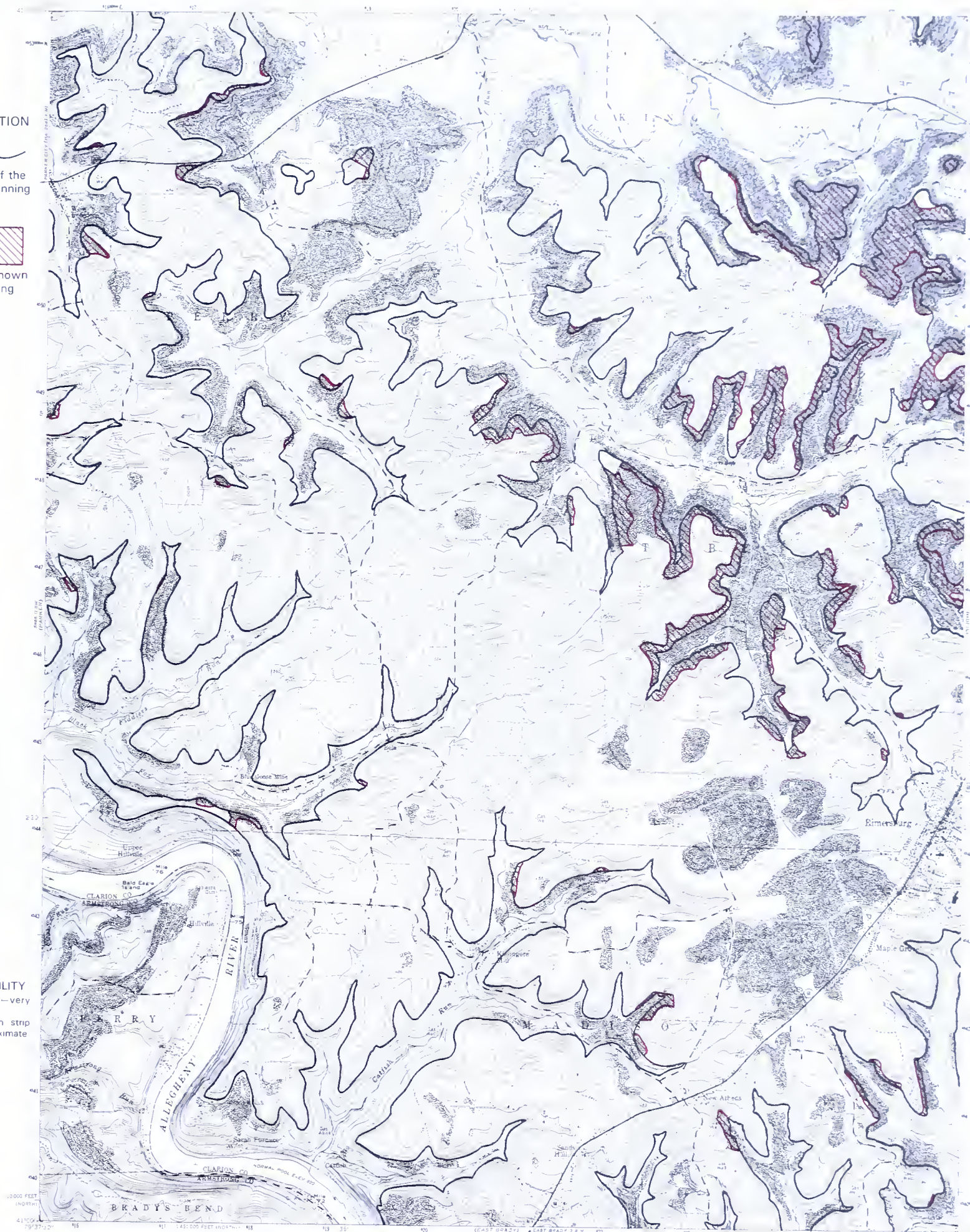


EXPLANATION

Crop line of the  
Middle Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL

RIMERSBURG





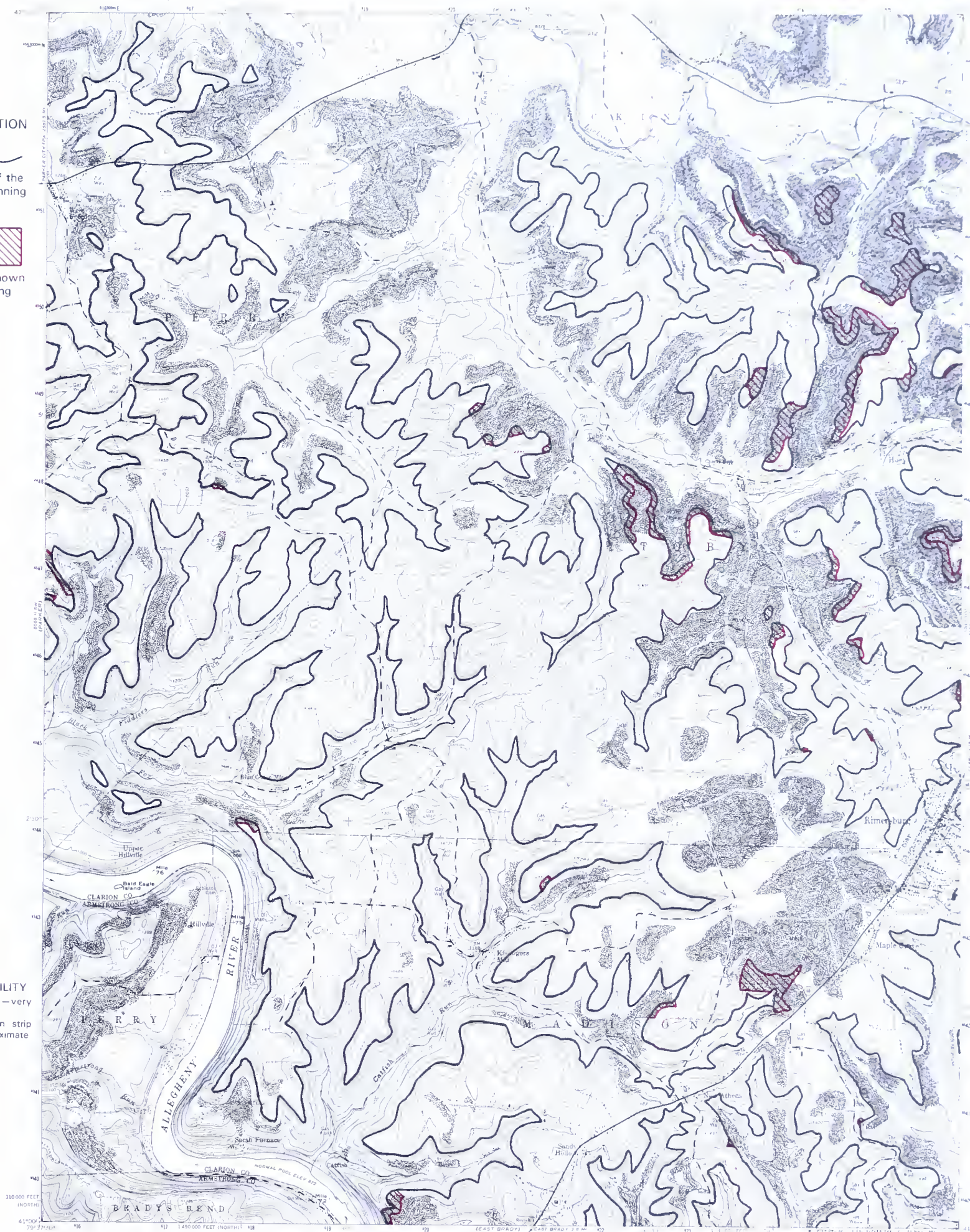


EXPLANATION

Crop line of the  
Upper Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:62500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Highway  
Medium  
Local  
Unimproved  
Trail

RIMERSBURG

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER KITTANNING COAL





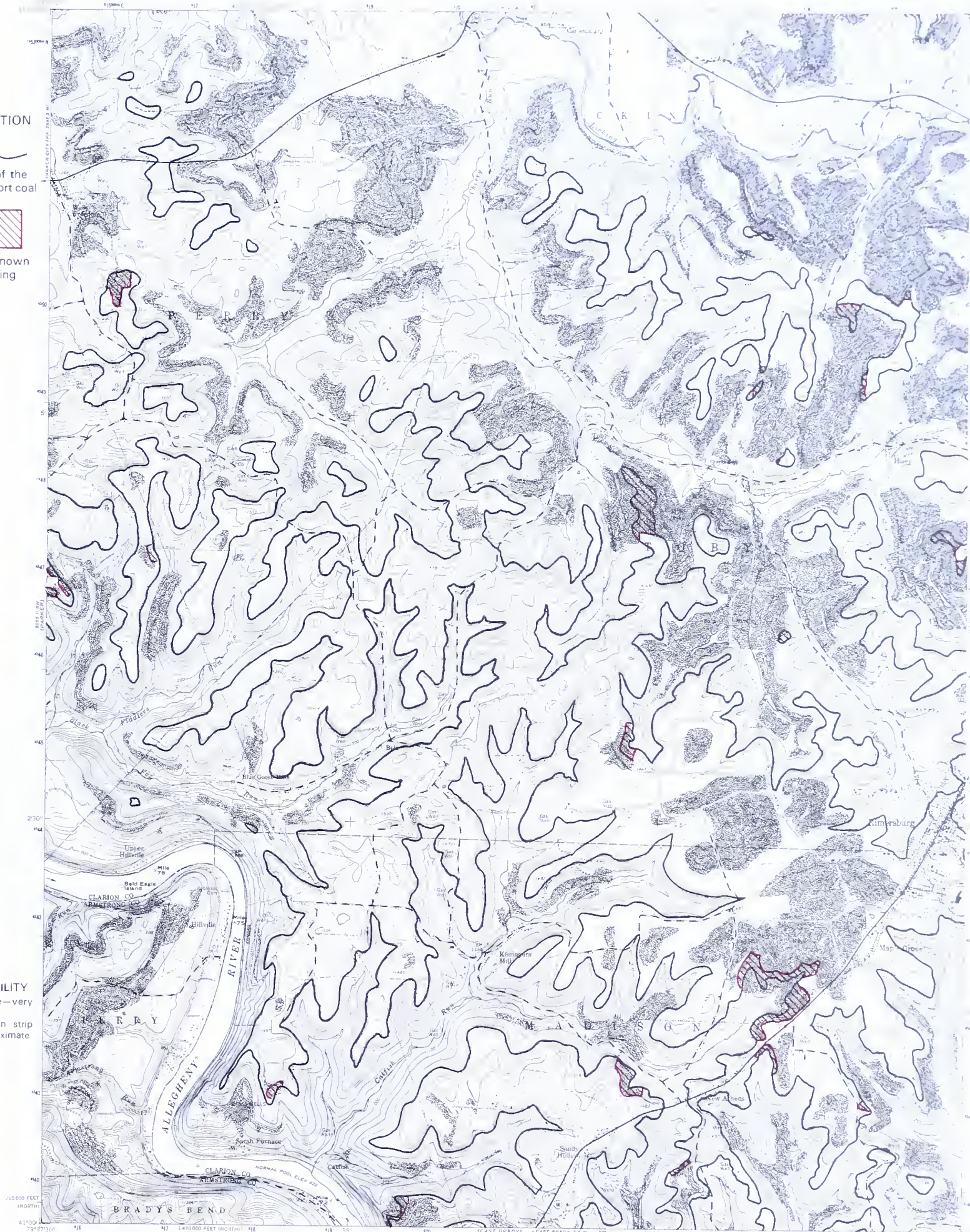
EXPLANATION

Crop line of the  
Lower Freeport coal



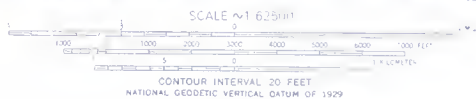
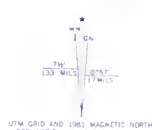
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



RIMERSBURG

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER FREEPORT COAL





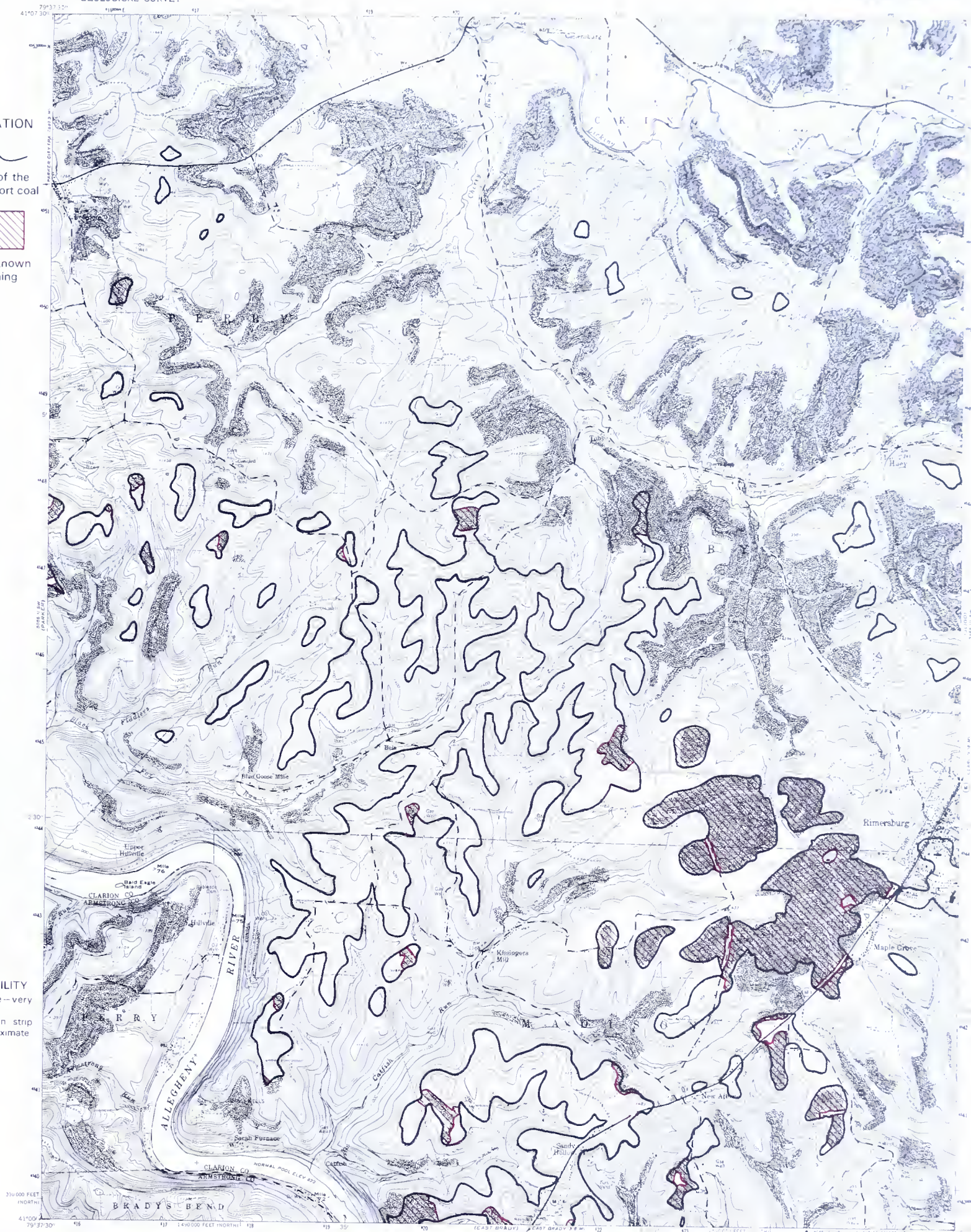
EXPLANATION

Crop line of the  
Upper Freeport coal



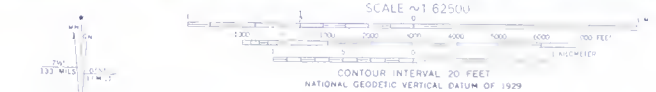
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION  
Heavy duty  
Medium duty  
Light duty  
Unimproved  
State Route

RIMERSBURG

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER FREEPORT COAL







EXPLANATION

CROP LINES

Upper Freeport coal

Lower Freeport coal

Upper Kittanning coal

Middle Kittanning coal

Lower Kittanning coal

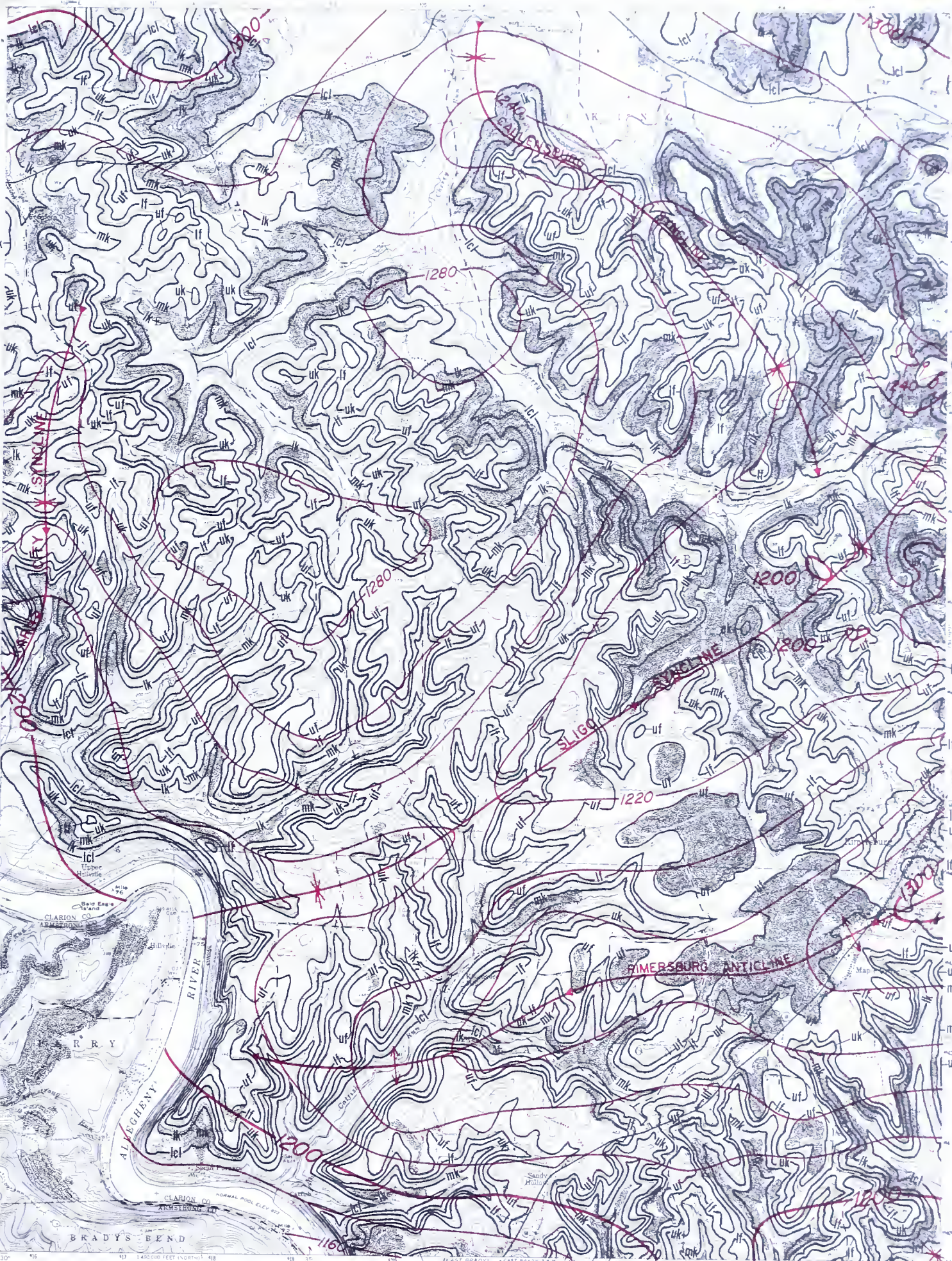
Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge

Syncline  
Showing axial-plane trace  
and direction of plunge

Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very  
good  
Structure contours—  
very good



SOURCE

Crop lines slightly modified and structure contours modified by  
A. D. Glover from unpublished map by Rochester and Pittsburgh  
Coal Company (1977)

UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

RIMERSBURG

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal



Extent of known  
strip mining

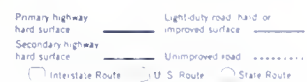
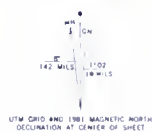
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



SLIGO

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





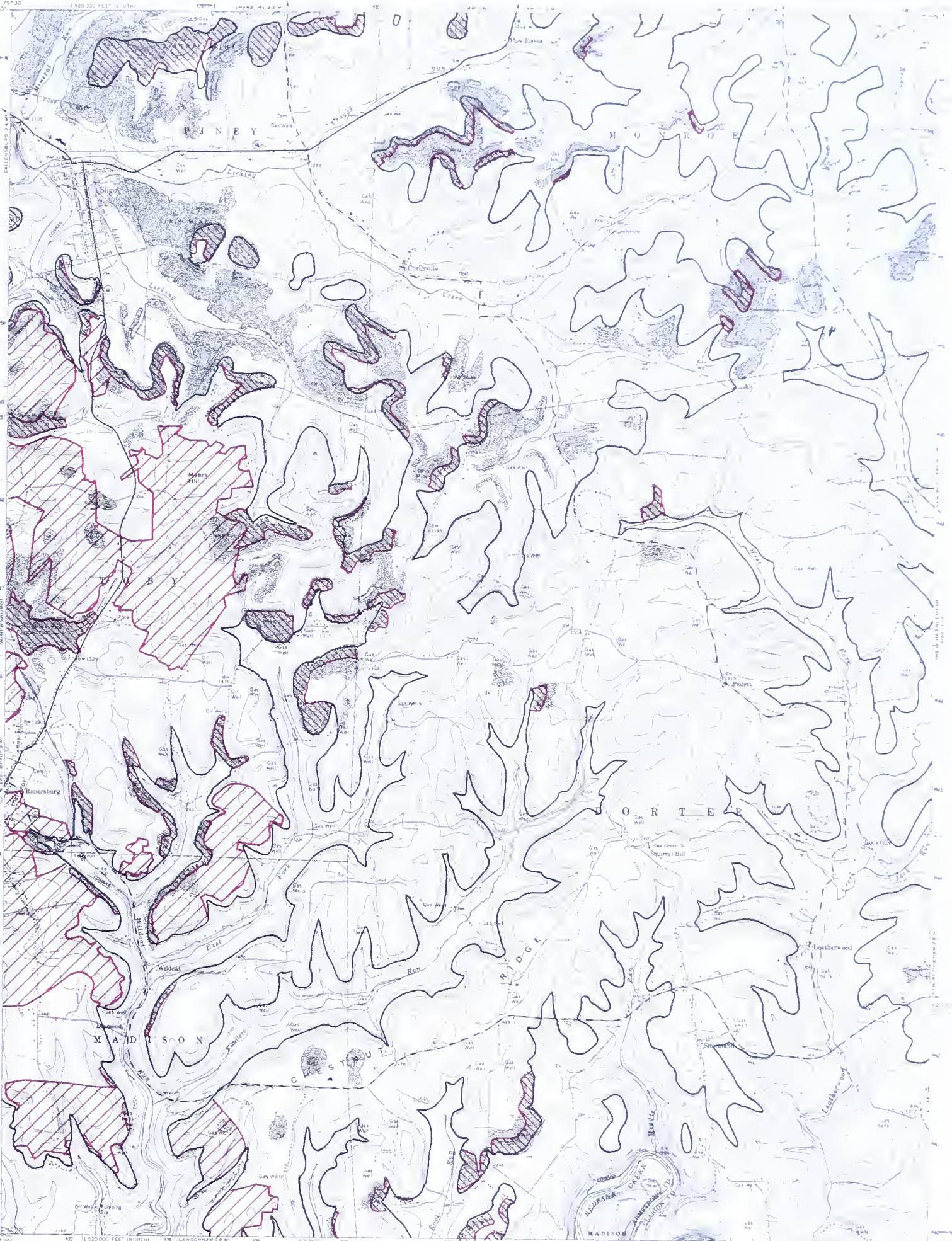
EXPLANATION

Crop line of the  
Lower Kittanning coal

Extent of known  
strip mining

Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.

UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



Primary highways  
hard surface  
Secondary highways  
hard surface  
Interstate Route  
State Route  
Unimproved road  
Gravel road

PENNSYLVANIA  
QUADRANGLE LOCATION

SLIGO

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

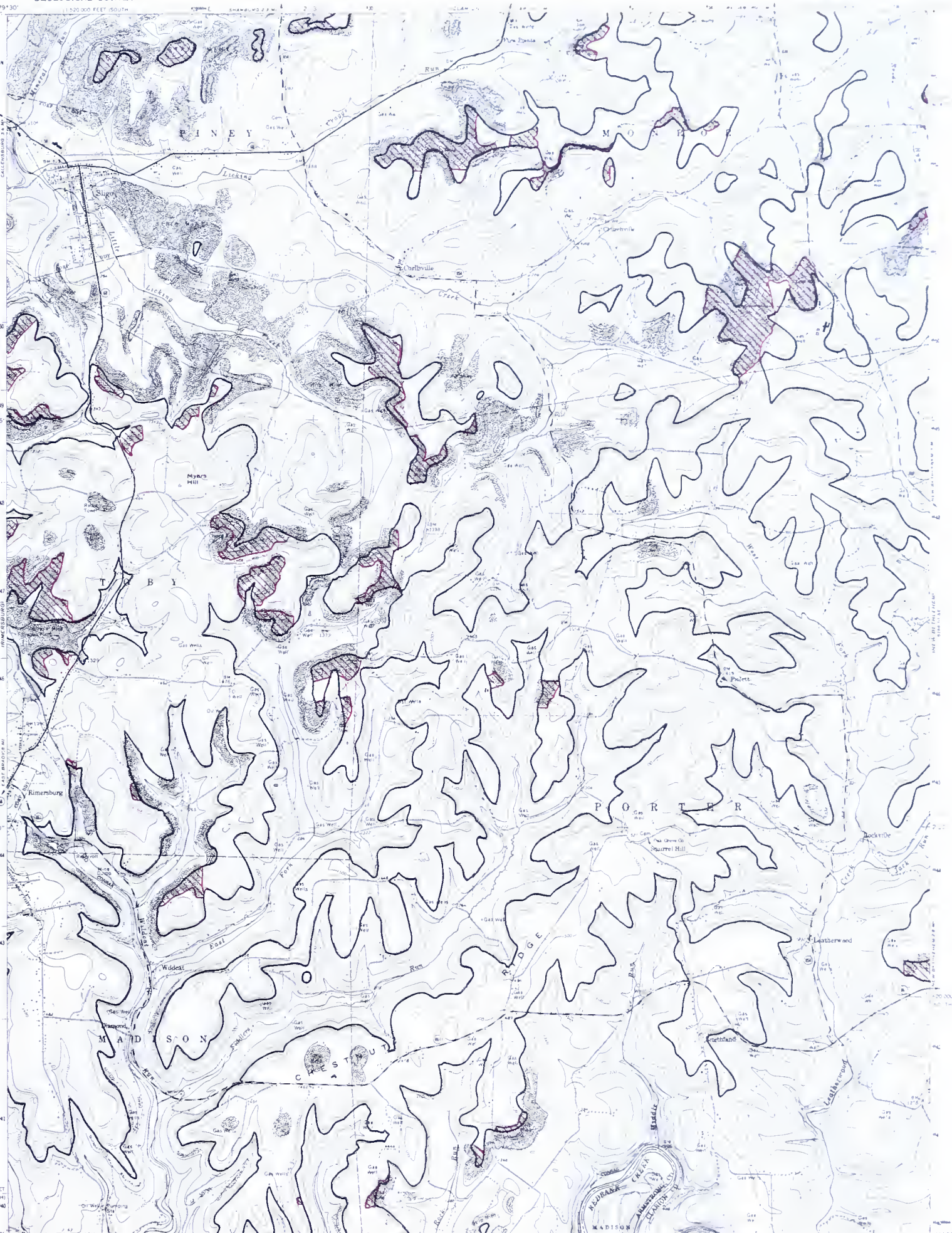




EXPLANATION

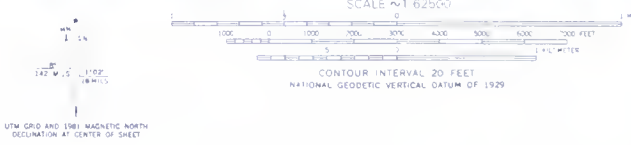
- Crop line of the Middle Kittanning coal
- Extent of known strip mining

MAP RELIABILITY  
Coal crop line—very good  
Limits of known strip mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic map.



- Primary highway  
Hard surface  
Secondary highway  
Hard surface  
Interstate Route  
U.S. Route  
State Route
- Light duty road  
Improved surface  
Improved road  
Improved road  
Improved road

SLIGO

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL



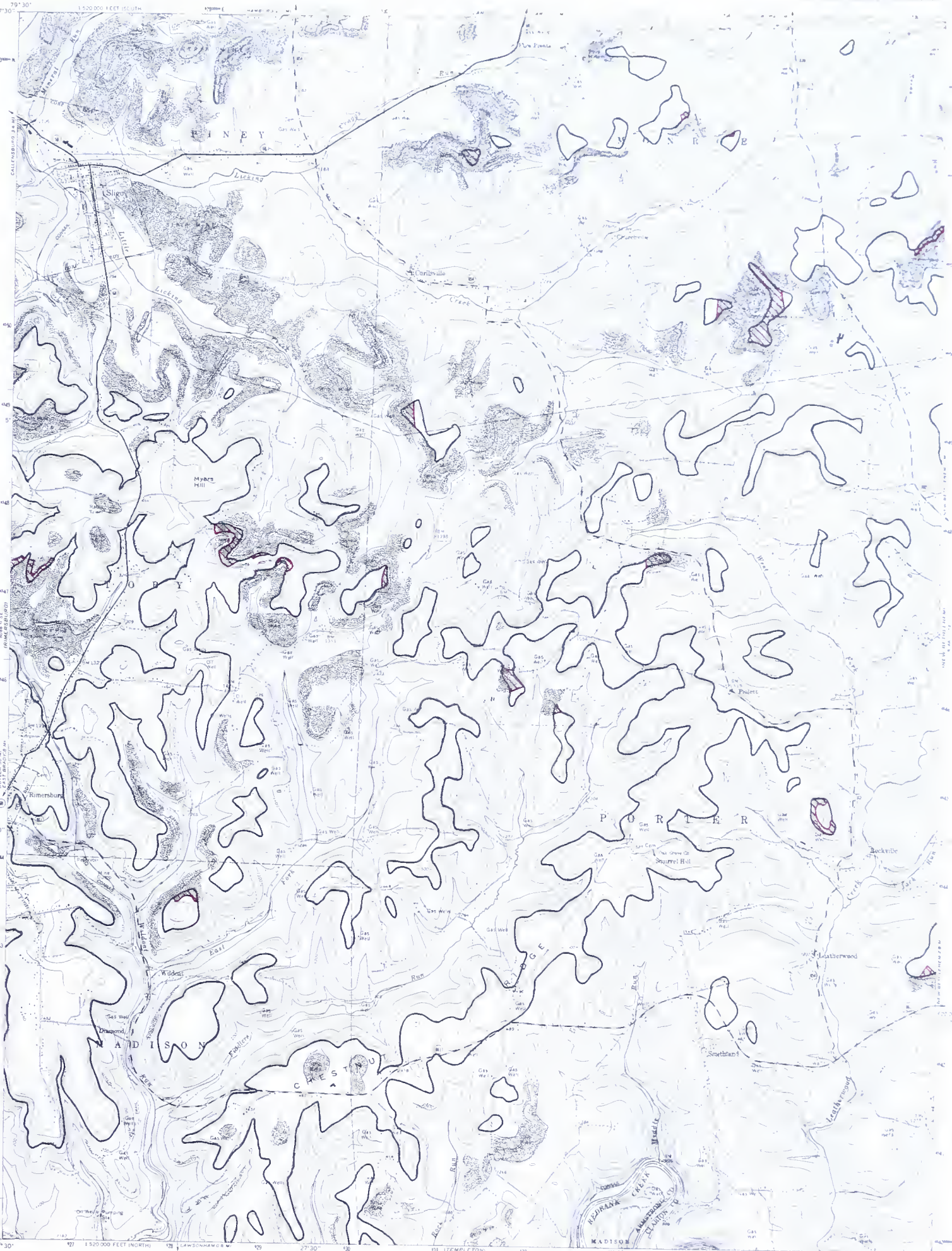


EXPLANATION

Crop line of the  
Upper Kittanning  
coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



CROP LINE AND MINED-OUT AREAS OF THE  
UPPER KITTANNING COAL

SLIGO







EXPLANATION

Crop line of the  
Lower Freeport coal



Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Primary highway  
hard surface  
Secondary highway  
hard surface  
Interstate Route  
Light-duty road, hard or  
improved surface  
Unimproved road  
U.S. Route  
State Route

PENNSYLVANIA  
QUADRANGLE LOCATION

SLIGO

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER FREEPORT COAL





EXPLANATION

Crop line of the  
Upper Freeport coal

Extent of known  
strip mining

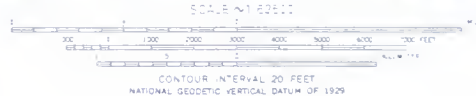
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



Primary highway  
State surface  
Secondary highway  
Railroad  
Interstate Route  
Unimproved road  
Improved road  
Unimproved road  
Improved road

SLIGO

CROP LINE AND MINED-OUT AREAS OF THE  
UPPER FREEPORT COAL









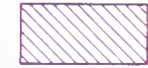






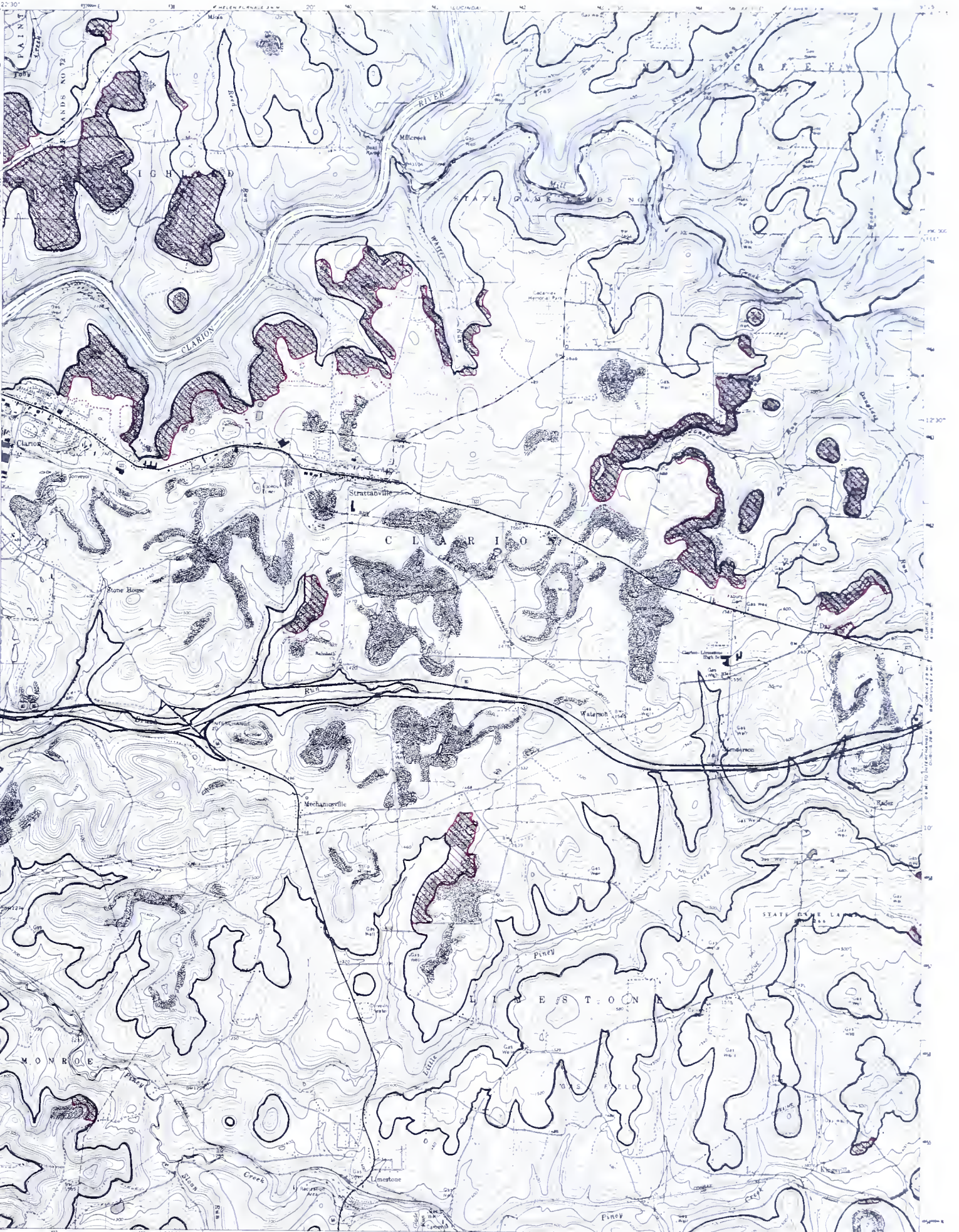
EXPLANATION

Crop line of the  
Lower Clarion coal



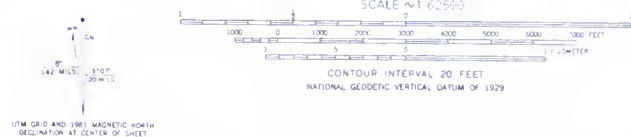
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION

Primary highway	Light-duty road, hard or
hard surface	improved surface
Secondary highway	Unimproved road
hard surface	
Instate Route	U. S. Route
	State Route

STRATTANVILLE

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

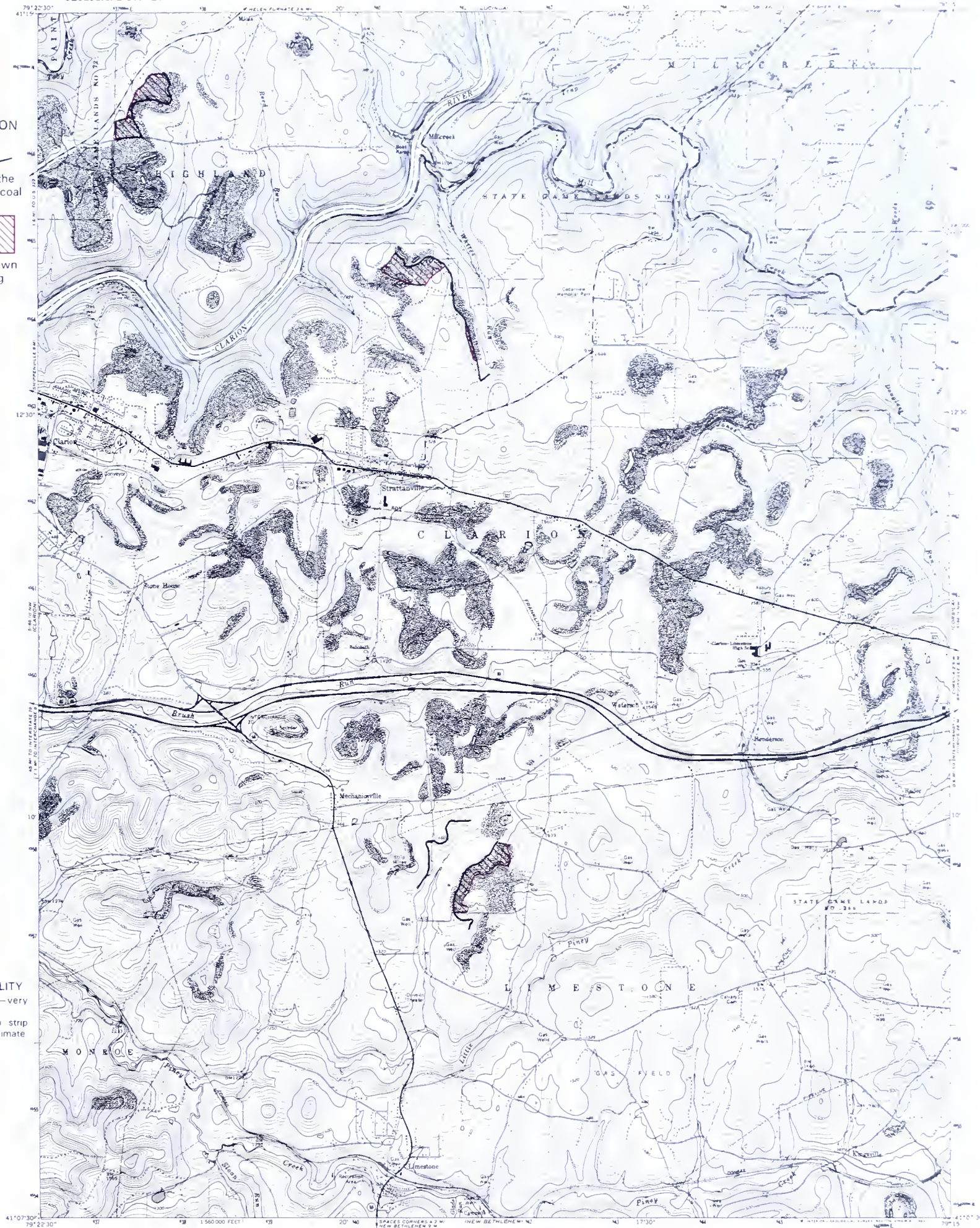
Crop line of the  
Upper Clarion coal



Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION

Primary highway	Light-duty road, hard or
hard surface	improved surface
Secondary highway	Unimproved road
hard surface	
Interstate Route	U.S. Route
	State Route

STRATTANVILLE

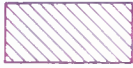
CROP LINE AND MINED-OUT AREAS OF THE  
UPPER CLARION COAL





EXPLANATION

Crop line of the  
Lower Kittanning  
coal

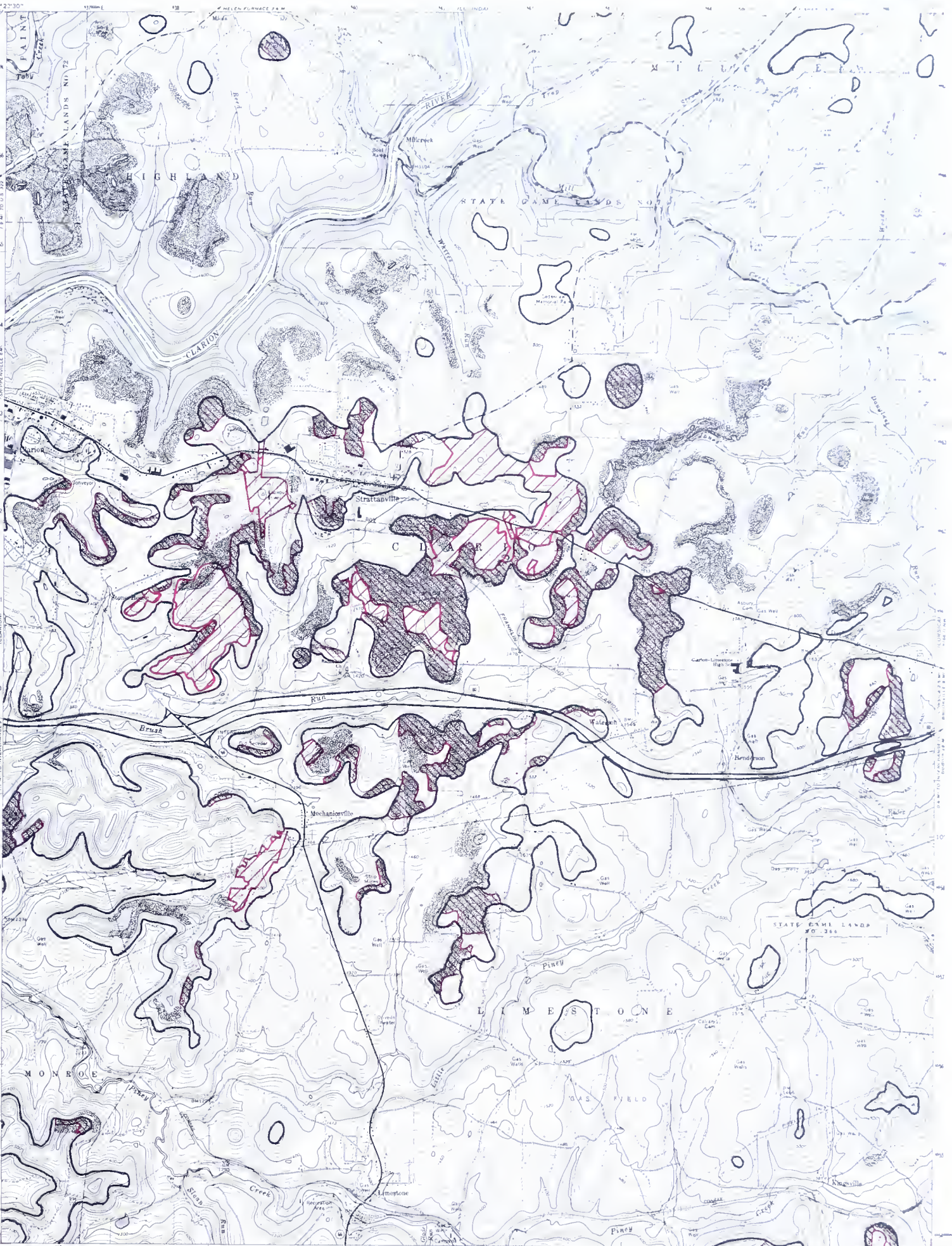


Extent of known  
strip mining



Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



ROAD CLASSIFICATION  
Primary highway, hard surface  
Secondary highway, hard surface  
Unimproved road  
Interstate Route  
U.S. Route  
State R. or L.

STRATTANVILLE

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL





EXPLANATION

Crop line of the  
Middle Kittanning  
coal

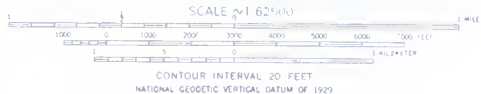
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



ROAD CLASSIFICATION

Primary highway  
hard surface  
Secondary highway  
hard surface

Light duty road hard  
improved surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

STRATTANVILLE

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL





EXPLANATION

Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



CROP LINE OF THE  
UPPER KITTANNING COAL

STRATTANVILLE





EXPLANATION

  
Crop line of the  
Lower Freeport coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).

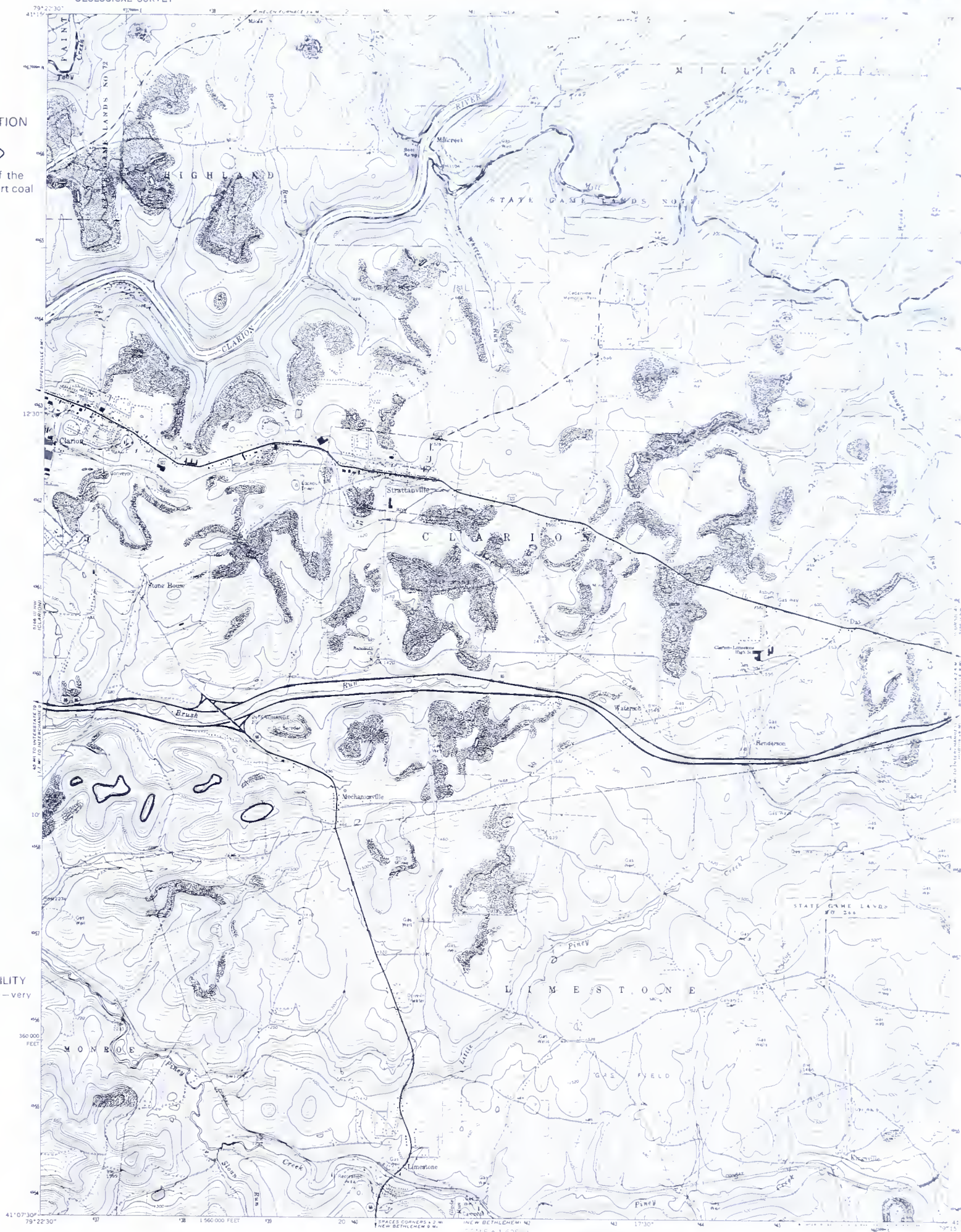
UTM GRID AND 1981 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SPACES CORNERS = 2 mi  
NEW BETHLEHEM 9 W.  
SCALE 1:62,500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Primary highway  
Secondary highway  
Interstate Route  
Light surface  
Improved surface  
Gravel surface  
Gravel road  
Gravel drive

STRATTANVILLE

CROP LINE OF THE  
LOWER FREEPORT COAL









# EXPLANATION

## CROP LINES

Lower Freeport coal

Upper Kittanning coal

Middle Kittanning coal

Lower Kittanning coal

Upper Clarion coal

Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge

Syncline  
Showing axial-plane trace  
and direction of plunge

Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level  
Contour interval 20 feet

## MAP RELIABILITY

Coal crop lines—very  
good  
Structure contours—  
very good

## SOURCE

Crop lines and structure contours slightly modified by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977).

1:62500  
SCALE  
1:62500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

1:62500  
SCALE  
1:62500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

1:62500  
SCALE  
1:62500  
CONTOUR INTERVAL 20 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

## STRATTANVILLE

## COAL CROP LINES AND STRUCTURE CONTOURS











EXPLANATION

Crop line of the  
Lower Kittanning  
coal

Extent of known  
strip mining

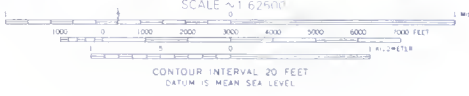
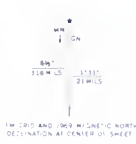
Extent of known  
deep mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



ROAD CLASSIFICATION

Primary highway hard surface	Light-duty road, hard or improved surface
Secondary highway hard surface	Unimproved road
Interstate Route	U. S. Route
	State Route

SUMMERVILLE

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL





EXPLANATION

Crop line of the  
Middle Kittanning  
coal

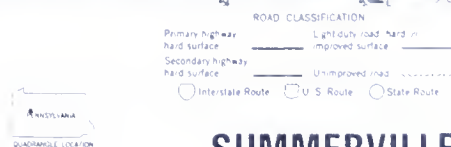
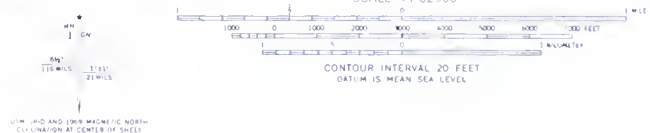
Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



SUMMERVILLE

CROP LINE AND MINED-OUT AREAS OF THE  
MIDDLE KITTANNING COAL





EXPLANATION

Crop line of the  
Upper Kittanning coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



ROAD CLASSIFICATION

Primary highway hard surface	Light duty road hard or improved surface
Secondary highway hard surface	Unimproved road
Interstate Route	U.S. Route
	State Route

SUMMERVILLE

CROP LINE AND MINED-OUT AREA OF THE  
UPPER KITTANNING COAL





EXPLANATION

Crop line of the  
Lower Freeport coal



Extent of known  
strip mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



SUMMERVILLE

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER FREEPORT COAL





EXPLANATION

Crop line of the  
Upper Freeport coal



Extent of known  
strip mining

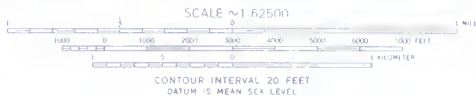
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1983 MAGNETIC NORTH  
DEFINITION OF LIMITS OF SHEET



ROAD CLASSIFICATION	
Primary highway hard surface	Light duty road, hard or improved surface
Secondary highway hard surface	Unimproved road
Interstate Route	U. S. Route
	State Route

SUMMERVILLE

CROP LINE AND MINED OUT AREAS OF THE  
UPPER FREEPORT COAL







# EXPLANATION

## CROP LINES

- Upper Freeport coal
- Lower Freeport coal
- Upper Kittanning coal
- Middle Kittanning coal
- Lower Kittanning coal
- Lower Clarion coal

- Syncline  
Showing axial-plane trace  
and direction of plunge.

- Structure contour  
Altitude of the base of the  
Lower Kittanning coal, in  
feet above mean sea level.  
Contour interval 20 feet.

## MAP RELIABILITY

- Coal crop lines—very good
- Structure contours—very good



## SOURCE

Crop lines and structure contours compiled by A. D. Glover from unpublished map by Rochester and Pittsburgh Coal Company (1977). Crop lines slightly modified by A. D. Glover.



## SUMMERVILLE

## COAL CROP LINES AND STRUCTURE CONTOURS



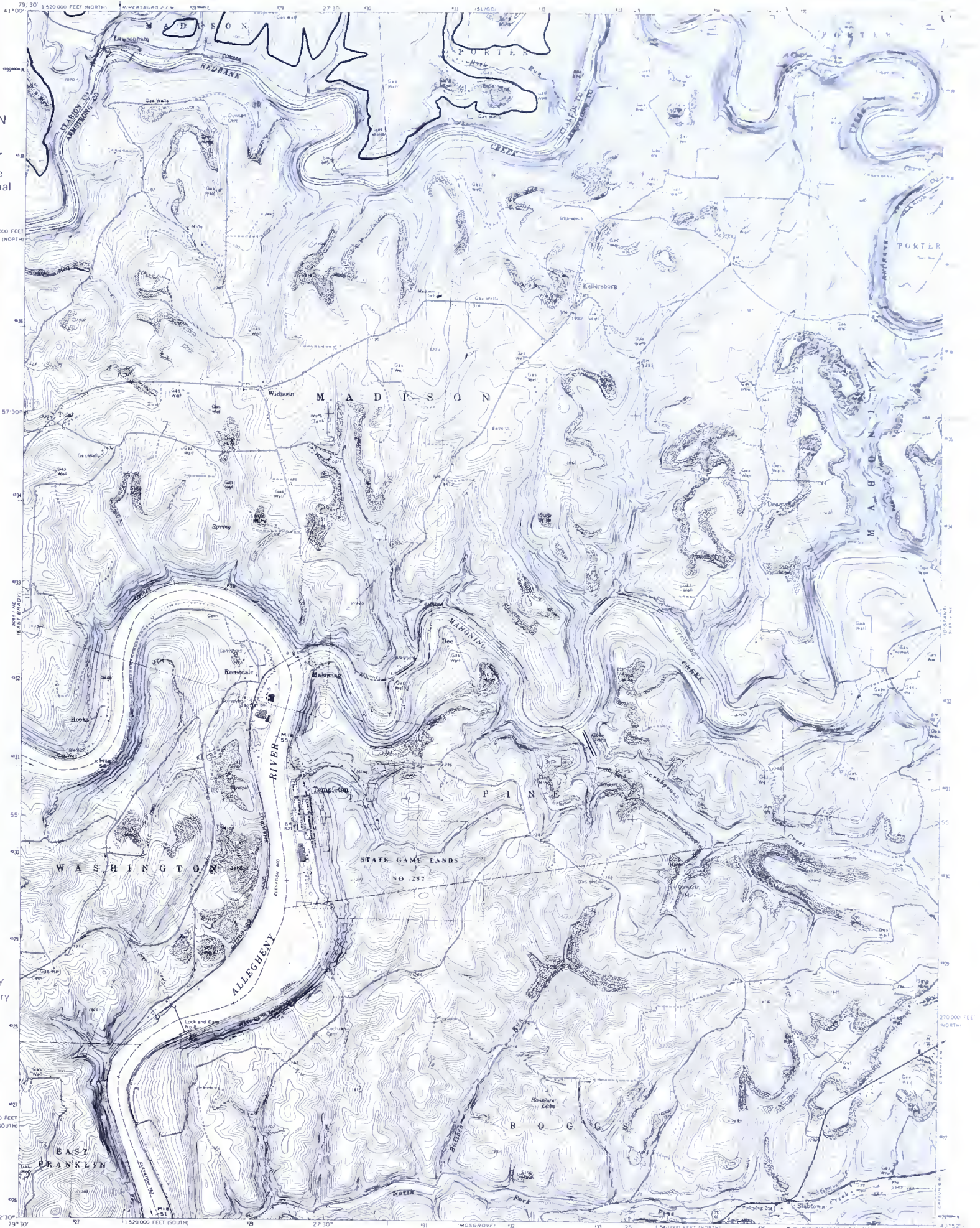






EXPLANATION

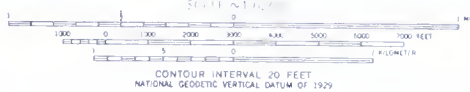
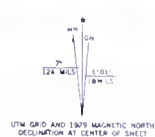
Crop line of the  
Lower Clarion coal



MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover from unpublished maps of Templeton quadrangle and adjoining quadrangles by Rochester and Pittsburgh Coal Company (1977).



ROAD CLASSIFICATION	
Primary highway hard surface	Light-duty road: hard or improved surface
Secondary highway, hard surface	Unimproved road
Interstate Route	U.S. Route
	State Route

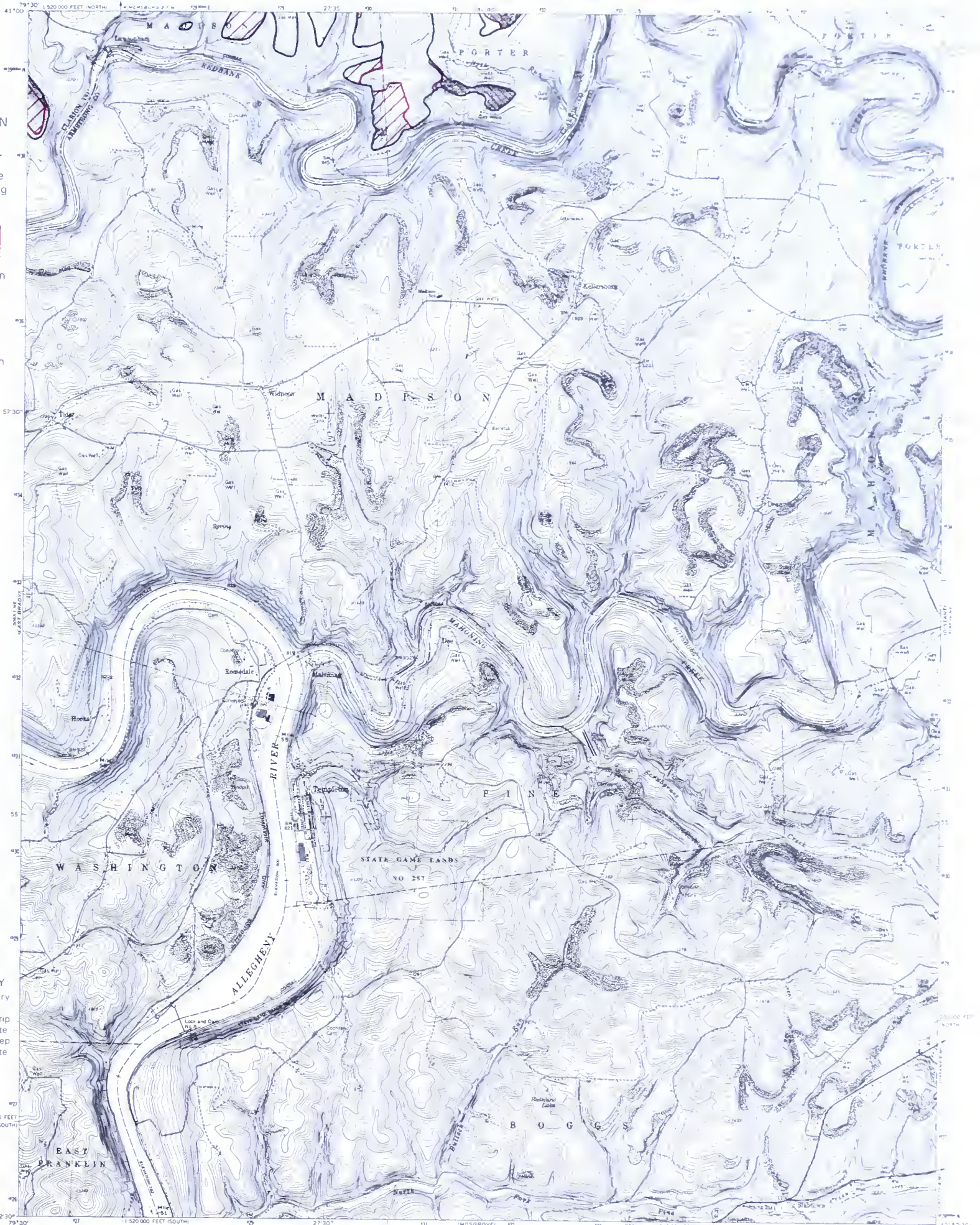


TEMPLETON

CROP LINE OF THE  
LOWER CLARION COAL

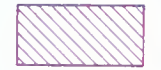






EXPLANATION

Crop line of the  
Lower Kittanning  
coal



Extent of known  
strip mining



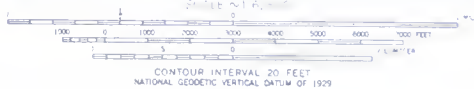
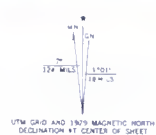
Extent of known  
deep mining

MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate  
Limits of known deep  
mining—approximate

SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.  
Limits of deep mining from unpublished mine maps.



CROP LINE AND MINED-OUT AREAS OF THE  
LOWER KITTANNING COAL

TEMPLETON







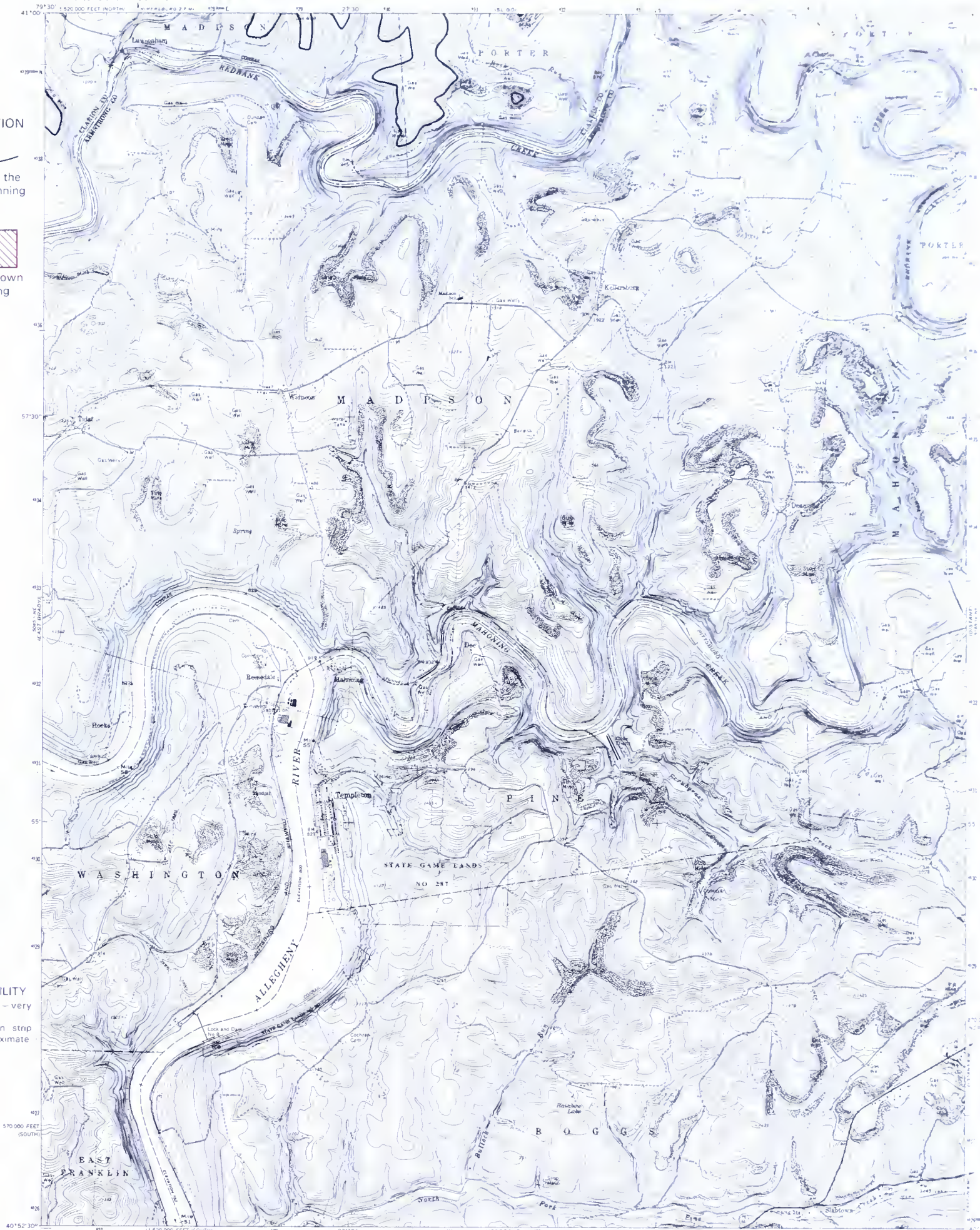
EXPLANATION

Crop line of the  
Middle Kittanning coal

Extent of known  
strip mining

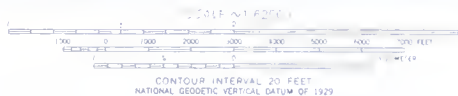
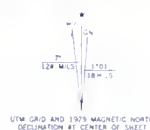
MAP RELIABILITY

Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.



TEMPLETON

CROP LINE AND MINED OUT AREA OF THE  
MIDDLE KITTANNING COAL





EXPLANATION

Crop line of the  
Upper Kittanning  
coal

MAP RELIABILITY  
Coal crop line—very  
good

SOURCE

Crop line compiled by A. D. Glover from unpublished maps of  
Templeton quadrangle and adjoining quadrangles by Rochester  
and Pittsburgh Coal Company (1977).

UTM GRID AND 1979 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



CROP LINE OF THE  
UPPER KITTANNING COAL

TEMPLETON





EXPLANATION

CROP LINES

uk  
Upper Kittanning coal

mk  
Middle Kittanning coal

lk  
Lower Kittanning coal

lcl  
Lower Clarion coal

Anticline  
Showing axial-plane trace and direction of plunge

Syncline  
Showing axial-plane trace and direction of plunge

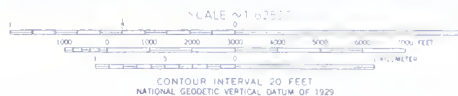
Structure contour  
Altitude of the base of the Lower Kittanning coal, in feet above mean sea level. Contour interval 20 feet.

MAP RELIABILITY  
Coal crop lines—very good  
Structure contours—very good

SOURCE

Crop lines and structure contours compiled by A. D. Glover from unpublished maps of Templeton quadrangle and adjoining quadrangles by Rochester and Pittsburgh Coal Company (1977). Structure contours slightly modified by A. D. Glover.

UTM GRID AND 1973 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET



TEMPLETON

COAL CROP LINES AND  
STRUCTURE CONTOURS





EXPLANATION

Crop line of the  
Lower Clarion coal

Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line compiled by A. D. Glover from unpublished map by  
Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

UTM GRID AND 1973 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

SCALE 1:62,500  
CONTOUR INTERVAL 20 FEET  
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION  
Primary highway all weather hard surface  
Secondary highway all weather hard surface  
Light duty road all weather improved surface  
Unimproved road fair or dry weather  
U.S. Route  
State Route

TIONESTA

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL





EXPLANATION

Crop line of the  
Lower Clarion coal



Syncline

Showing axial-plane trace  
and direction of plunge.

1640

Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet

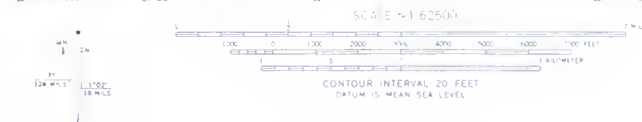
MAP RELIABILITY

Coal crop line—very  
good  
Structure contours—  
very good



SOURCE

Crop line and structure contours compiled by A. D. Glover from  
unpublished map by Rochester and Pittsburgh Coal Company  
(1977). Structure contours slightly modified by A. D. Glover.



ROAD CLASSIFICATION  
Primary highway: all-weather, light-duty road, all-weather  
hard surface, improved surface  
Secondary highway: all-weather, unimproved road, fair or poor  
hard surface, weather

U.S. Route State Route

COAL CROP LINE AND  
STRUCTURE CONTOURS

TIONESTA





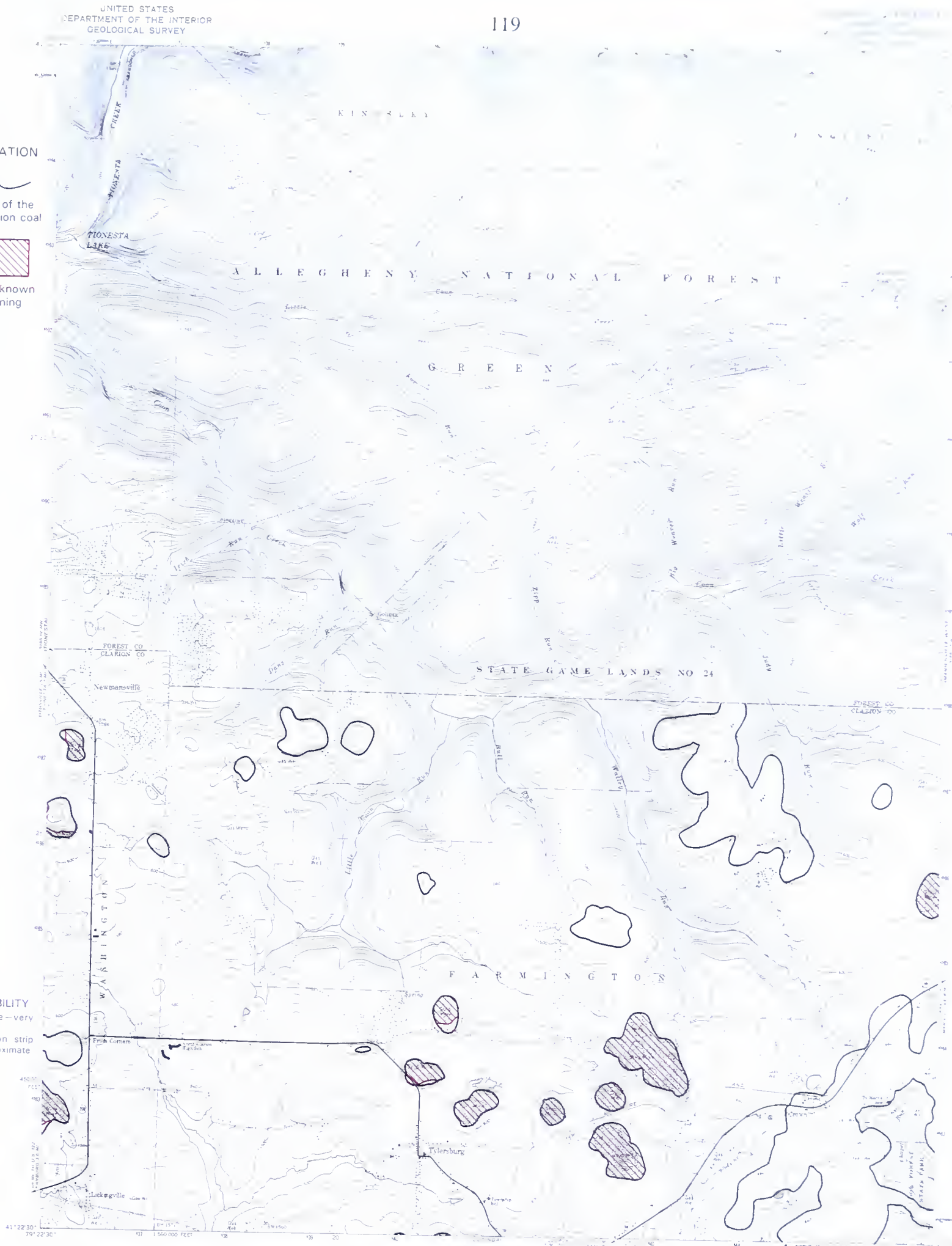
EXPLANATION

Crop line of the  
Lower Clarion coal



Extent of known  
strip mining

MAP RELIABILITY  
Coal crop line—very  
good  
Limits of known strip  
mining—approximate



SOURCES

Crop line slightly modified by A. D. Glover from unpublished  
map by Rochester and Pittsburgh Coal Company (1977).  
Limits of strip mining based on interpretation of topographic  
map.

CROP LINE AND MINED-OUT AREAS OF THE  
LOWER CLARION COAL

TYLERSBURG





EXPLANATION

Crop line of the  
Lower Clarion coal

Anticline  
Showing axial-plane trace  
and direction of plunge.

Syncline  
Showing axial-plane trace  
and direction of plunge.

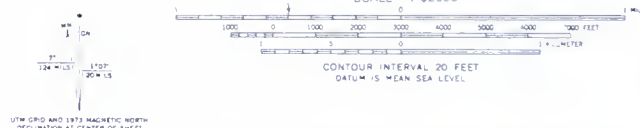
1600  
Structure contour  
Altitude of the base of the  
Lower Clarion coal, in feet  
above mean sea level. Con-  
tour interval 20 feet.

MAP RELIABILITY  
Coal crop line—very  
good  
Structure contours—  
very good



SOURCE

Crop line and structure contours slightly modified by A. D. Glover  
from unpublished map by Rochester and Pittsburgh Coal Com-  
pany (1977).



ROAD CLASSIFICATION  
Primary highway all weather Light duty road all weather  
Hard surface Unimproved road all or dry weather  
State Route



TYLERSBURG

COAL CROP LINE AND  
STRUCTURE CONTOURS









